User Manual

LB-100 thru LB-240

All steam boilers are built in accordance with ASME miniature boiler code.

NOTE: It is the responsibility of the installer to conform with any state or local codes. If further inspection, following modification by installer, is required under state or local codes, that is the responsibility of the local installer.

rev. 10062008

www.electrosteam.com

TABLE OF CONTENTS

1.) INSTALLATION INSTRUCTIONS **3**

2.) OPERATION & SEQUENCE OF EVENTS **4**

3.) CLEANING & MAINTENANCE **5-11**

3.1) MANUAL "BLOW DOWN" **5**

3.2) CLEANING WATER LEVEL PROBES **5-6**

3.3) CLEANING OR REPLACING HEATERS **6**

3.4) REPLACING GLASS GAUGE AND RUBBER WASHERS **7-8**

3.4.1) BRASS SIGHT GLASS (STANDARD) 7

3.4.1) BRASS SIGHT GLASS (SEISMIC) 8

3.5) CHAMBER CLEANING & CHEMICAL TREATMENT **9-10**

3.6) PRESSURE CONTROL DATA SHEET **11**

3.7) SETTING THE PRESSURE CONTROLS **12-13**

4.) CALCULATIONS & DATA SHEETS **14-15**

4.1) HEATER POWER & VOLTAGE RATINGS **14**

4.2) AMPERAGE CALCULATIONS **14-15**

4.3) ACTUAL POWER RATING CALCULATIONS **15**

4.4) STEAM CAPACITY CALCULATIONS **16**

5.) DRAWINGS & WIRING SCHEMATICS **17-36**

5.1) PARTS LEGENDS **17-20**

5.1.1) LB (100-240KW) (LOW PRESSURE) (0-15PSI) 17

5.1.2) LB (100-240KW) (LOW PRESSURE)(MAFD) (0-15PSI) 18

5.1.3) LB (100-240KW) (HIGH PRESSURE)(0-30, 0-100PSI) 19

5.1.4) LB (100-240KW) (HIGH PRESSURE)(MAFD) (0-30, 0-100PSI) 20

5.2) INSTALLATION DATA SHEETS **21-24**

5.2.1) LB (100-240KW) (LOW PRESSURE) (0-15PSI) 21

5.2.2) LB (100-240KW) (LOW PRESSURE)(MAFD) (0-15PSI) 22

5.2.3) LB (100-240KW) (HIGH PRESSURE)(0-30, 0-100PSI) 23

5.2.4) LB (100-240KW) (HIGH PRESSURE)(MAFD) (0-30, 0-100PSI) 24

5.3) CONTROL WIRING SCHEMATICS **25-28**

5.3.1) LB (LOW PRESSURE) (0-15PSI) 25

5.3.2) LB (LOW PRESSURE)(MAFD) (0-15PSI) 26

5.3.3) LB (HIGH PRESSURE)(0-30, 0-100PSI) 27

5.3.4) LB (HIGH PRESSURE)(MAFD) (0-30, 0-100PSI) 28

5.4) HEATER WIRING SCHEMATICS **29-36**

5.4.1) LB (100-120KW) (THREE PHASE) (208-240V) 29

5.4.2) LB (150-240KW) (THREE PHASE) (208-240V) 30

5.4.3) LB (100-120KW) (THREE PHASE) (380-425V) 31

5.4.4) LB (150-180KW) (THREE PHASE) (380-425V) 32

5.4.5) LB (240KW) (THREE PHASE) (380-425V) 33

5.4.6) LB (100-120KW) (THREE PHASE) (440-600V) 34

5.4.7) LB (150KW) (THREE PHASE) (440-600V) 35

5.4.8) LB (180-240KW) (THREE PHASE) (440-600V) 36

6.) TERMS & CONDITIONS **37**

1.) INSTALLATION INSTRUCTIONS

LITTLE BOILER "LB-SERIES"

The Electro-Steam Generator design consists essentially of a high pressure chamber filled with water that is heated by one or more submerged resistance type electric heating elements. Automatic controls are provided to maintain the pre-set operating pressure and water level. Safety features include: automatic low-water cutoff (manual low-water reset optional), dual pressure controls, safety valve, and visible water level gauge. All of our generators are built in accordance with A.S.M.E. Miniature Boiler Code and are individually inspected and stamped by an Authorized National Board Insurance Inspector.

IMPORTANT – READ ALL INSTRUCTIONS BEFORE OPERATING

Important – Set unit perfectly level, and as close as possible to the steam vessel or appliance it will operate. For generator measurements, refer to Installation Data Drawing attached. For interpretation of numbered items, refer to Parts Legend Drawing attached. NOTE: Ambient temperature around this unit must not exceed 105°F.

Water Supply – Connect city water line to **Y-Strainer (#6)**. Supply pressure not to exceed 150 PSI. If you have a low pressure generator, water supply pressure must be at least 10 PSI higher than the operating pressure.

***CAUTION:** The **Pump (#8)** requires clean tap water. If the water is not free of foreign matter, a 5 micron cartridge filter should be installed in the water supply line. **NOTE:** If treatment is used, purity should **NOT** exceed 26,000 ohms.

Steam Outlet – Connect **Steam Outlet Valve (#16)** to piece of equipment, vessel, room, or area to be operated by Electro Steam Generator

Safety Valve – Connect **Safety Valve (#18)** separately than **Drain (#19)** to a high temperature drain ***NO PVC**. Discharging pipe should never be smaller than the valve outlet and should be rigidly supported, placing no weight on the safety valve itself.

Drain – Connect **Drain (#19)** separately than **Safety Valve (#18)** to a high temperature drain ***NO PVC**. If equipped with **Motorized Auto-Flush & Drain "MAFD" (#20)**, MAFD should also be connected to drain.

Electrical – A fused disconnect box of proper size should be installed close to Generator. Voltage(s), KW, and Phase(s) required to run generator are marked on name plate of generator.

NOTE: Check tightness of **ALL** connections periodically. Disconnect box and wire gauges should be sized and installed by a licensed electrician in accordance with your local codes.

2.) OPERATION & SEQUENCE OF EVENTS

IMPORTANT – READ INSTALLATION INSTRUCTIONS BEFORE OPERATING

1. Turn on water supply from the source to the Generator.
2. **OPEN** all valves on the Generator except for the **Manual Drain (#19)**.
3. Place main disconnect box in **ON** position.
4. Place **ON/OFF Switch (#2)** in **ON** position.
   - The **Water Solenoid (#7)** [and **Pump (#8)**, if high pressure] will engage and the chamber will begin to fill with water. As the water level rises, it will make contact with the **(G OR D)** and **(A)** probes, indicating the heaters are safely submerged. At this time the contactor(s) will engage, supplying power to the heaters, causing steam pressure to accumulate.
   - The chamber will continue to fill with water until 3 seconds after the water makes contact with the **(C)** probe, causing the **Water Solenoid (#7)** [and **Pump (#8)**, if high pressure] to turn off.
   - If the contactor(s) still have not engaged at this time, you may need to press the **Safety Reset (#13)** on the "**Safety" Pressure Control (#12)**. If your generator is equipped with a **Manual Low-Water Reset (MLWR) (#3)**, it must be pressed at this time to engage the contactor(s). If your generator is equipped with a **Motorized Auto-Flush & Drain (MAFD) (#20)**, you must wait until it closes before the contactor(s) will engage. (approximately 3 minutes)
   - Steam pressure will continue to rise until is reaches its set operating pressure. This may take up to 25 minutes. At this time, the "**Control" Pressure Control (#12)** will cause the contactor(s) to disengage. The pressure will drop approximately 2-8 PSI until the "**Control" Pressure Control (#12)** causes the contactor(s) to reengage, causing the pressure to rise again. The contactor(s) will continue to cycle on and off during operation.
5. The Generator is now fully operational and will produce steam until it is turned off.
   - As steam is exhausted, the water level will drop until 3 seconds after it breaks contact with the (C) probe. At this time, the **Water Solenoid (#7)** [and **Pump (#8)**, if high pressure] will engage and the chamber will again fill with water. The chamber will continue filling until 3 seconds after the water makes contact with the (C) probe. The **Water Solenoid (#7)** [and **Pump (#8)**, if high pressure] will continue to cycle on and off during operation.
6. To shut off the Generator, place **ON/OFF Switch (#2)** in **OFF** position. Pressure will drop naturally as the chamber cools, or the Generator may be drained manually through **Manual Drain (#19)**. (See Manual Blow Down 3.1)

WARNING – **HOT WATER** and **STEAM** under **HIGH PRESSURE** can lift drain pipes right off the ground and cause **SERIOUS INJURY**. Make sure drain pipe is **SECURE** and **CANNOT** move. The drain must be directed into a **HIGH TEMPERATURE** drain (**NO PVC**) or outside.

3.) CLEANING & MAINTENANCE

The following cleaning procedures are **HIGHLY RECOMMENDED** in order to keep your Steam Generator in the best operating condition at all times.

3.1) MANUAL "BLOW DOWN"

A Manual "Blow Down" is an easy way to **GREATLY** extend the life of your Steam Generator. Using a Motorized Auto-Flush & Drain (MAFD) of course helps, but is not a "Cure all". The following is the **LEAST** amount of times recommended to blow down your generator:

NORMAL WATER AREAS – Should be done **ONCE A WEEK**.
BAD WATER AREAS – Should be done **ONCE A DAY**.
NORMAL WATER AREAS WITH MAFD – Should be done **TWICE A MONTH**.
BAD WATER AREAS WITH MAFD – Should be done **ONCE A WEEK**.

NOTE: The best time to Blow Down your generator is after it has been running for some time, while it is still hot.

1. Place **Toggle Switch (#2)** in **OFF** position.
2. Allow pressure to drop between 10 and 20 PSI.
3. Open **Manual Drain (#19)** slowly, allowing **HOT WATER** and **STEAM** to blow out into the drain, cleaning out the generator.

NOTE: Blow Down your generator at any pressure you feel comfortable with. 10 to 20 PSI is only a recommendation. You may go higher or lower, but higher is always better.

WARNING – **HOT WATER** and **STEAM** under **HIGH PRESSURE** can lift drain pipes right off the ground and cause **SERIOUS INJURY**. Make sure drain pipe is **SECURELY STRAPPED** and **CANNOT** move. The drain must be directed into a **HIGH TEMPERATURE** drain (**NO PVC**).

3.2) CLEANING WATER LEVEL PROBES

Water Level Probes are the heart of your generator. Almost all steam generator malfunctions are caused by dirty water level probes. **CLEANING** your **PROBES** is by far the **MOST IMPORTANT** maintenance step to keep your generator running properly. The following is the **LEAST** amount of times recommended to clean your probes:

NORMAL WATER AREAS – Should be done **TWICE A YEAR**.
BAD WATER AREAS – Should be done **3-4 TIMES A YEAR**.

NOTE: The best time to clean your probes is before you turn your generator on, while it is still cool.

1. Place main disconnect box and the **Toggle Switch (#2)** in the **OFF** position.
2. Make sure generator is cool and the **Pressure Gauge (#15)** reads 0 PSI.
3. Find the water level probes (#5), located in the blue box on top of generator.
4. Unscrew the four Philips head screws and remove cover plate, exposing the water level probes (#5).
5. Use 5/16" Socket to remove wires from probes.
6. Use 13/16" Spark Plug Socket to remove probes from chamber.

3.2) CLEANING WATER LEVEL PROBES (Continued)

7. Clean probes to remove rust and scaling.
   NOTE: To clean probes you may use wire wheel, wire brush, steal wool, or Scotch-Brite. (Wire wheel works the best) You may also want to try some sort of chemical like CLR remover or LIME-A-WAY.
8. Reinstall probes assuring each probe's length is assigned to its proper letter.
9. Reconnect wires to probes assuring each color is also assigned to its proper letter.
   NOTE: DO NOT make wires too tight. Just tighten enough to make contact. Over tightening can cause probe plugs to pull apart over time.
10. Reinstall cover plate.

Water Level Probe Specifications:

Letter Assignment on Chamber	A	B	C	D/G
Water Level Probe Length	5 ¼"	5 ½"	3 ¾"	5 ½"
Wire Color Assignment	RED	Not Used	BLACK	GREEN
Assignment on Dual Function Board	LLCO	Not Used	H	G

NOTE: The (B) Probe is not used. It is a spare probe that can be cut and used to replace any one of the other probes.

WARNING – There **MUST be NO PRESSURE** in the chamber when removing probes. If you must change probes while chamber is **HOT**, make sure the steam out and drain valves are open to assure chamber will remain depressurized. **DO NOT** touch probes with your bare hands while **HOT**, and be cautious of escaping steam from probe holes while probes are removed.

3.3) CLEANING OR REPLACING HEATERS

Heaters are located inside the **Control Panel (#1)** below the insulation barrier, bolted into the chamber. If (3.5) Chamber Chemical/Acid Treatments are not regularly done, heaters must be taken out at least **ONCE A YEAR**, cleaned with wire brush and reinstalled using a new gasket. If you are replacing or cleaning your heater elements:

1. Place main disconnect box(es) and the **Toggle Switch (#2)** in the OFF position.
2. Make sure generator is cool and the **Pressure Gauge (#15)** reads 0 PSI.
3. Remove heater wires from heater(s), using a 3/8" Socket.
4. Unbolt and remove heater(s) using a 1 1/16" Socket.
   NOTE: Heater(s) may be difficult to get out; you may need to use some sort of pry bar to get them loose.
5. Clean heater(s) with wire brush. If replacing, dispose of old heater(s).
6. Reinstall heater(s) with new gasket(s).
7. Attach heater wires assuring proper wiring. *Refer to Heater Wiring Schematics attached*

NOTE: If you are replacing a heater because of a heater failure, you must also clean the probes and clean out the chamber, or you may have another heater failure within 48 hours.

3.4) REPLACING GLASS GAUGE & RUBBER WASHERS OR GLASS PACKINGS

The **Sight Glass (#10)** gives the operator the ability to easily monitor the actual water level inside the chamber. If the **Sight Glass (#10)** gets clogged or is no longer functional, it can be very difficult to troubleshoot a problem.

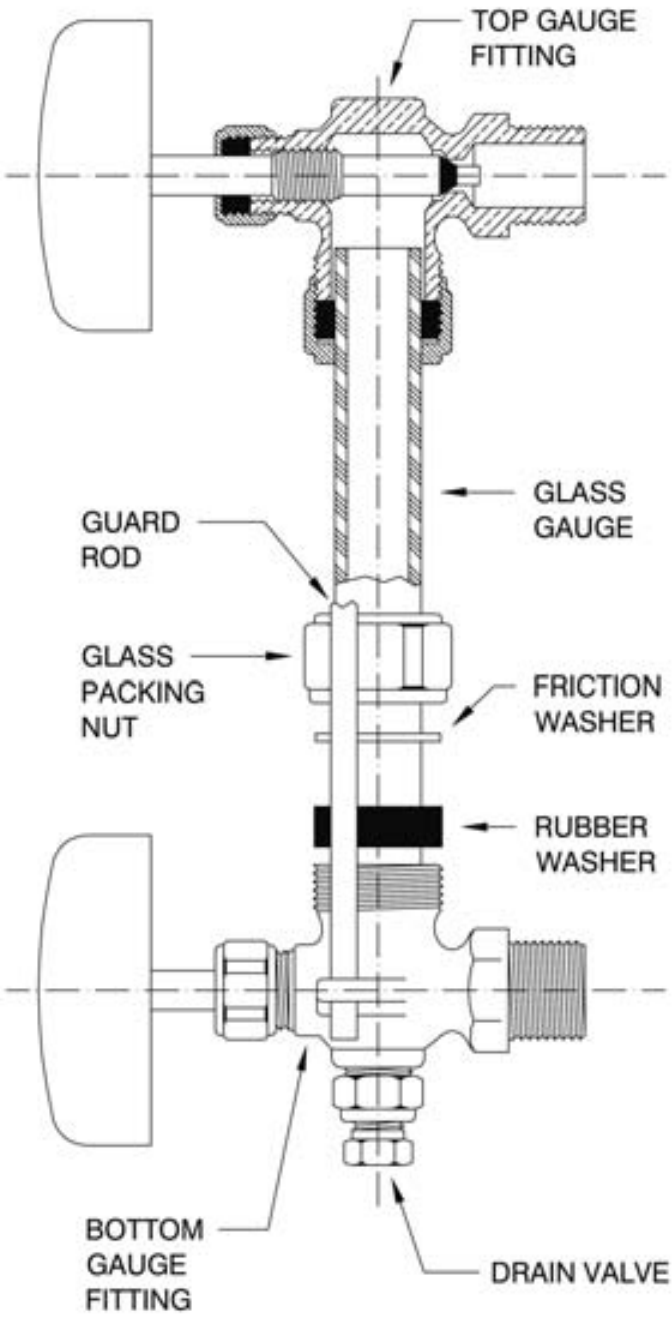
3.4.1) BRASS SIGHT GLASS (STANDARD)

GLASS GAUGE and **RUBBER WASHERS MUST** be replaced **EVERY SIX MONTHS**

INSTALLATION:

Only properly trained personnel should install and maintain water gauge glass and connections. Remember to wear safety gloves and glasses during installation. Before installing, make sure all parts are free of chips and debris.

1. Uninstall **GUARD RODS, GLASS GAUGE,** and **RUBBER WASHERS**. (you may need to rotate one of the **GAUGE FITTINGS** to remove **GLASS GAUGE**)
2. Slip a new **RUBBER WASHER** on the new **GLASS GAUGE** about an inch from the bottom.
3. Now slip the following items through the top of **GLASS GAUGE** in the following order:
   - **FRICTION WASHER**
   - **GLASS PACKING NUT** (facing down)
   - **GLASS PACKING NUT** (facing up)
   - **FRICTION WASHER**
   - **RUBBER WASHER** (inch down from top)
4. Gently insert **GLASS GAUGE** into **GAUGE FITTINGS**. You may need to rotate **GAUGE FITTINGS** until vertically aligned, after **GLASS GAUGE** is in.
5. Carefully raise **GLASS GAUGE** about 1/16” from bottom and slide lower **RUBBER WASHER** down until it makes contact with the **BOTTOM GAUGE FITTING**. (**DO NOT** allow **GLASS GAUGE** to remain in contact with any metal)
6. Carefully slide upper **RUBBER WASHER** up as far as possible.
7. Hand tighten both **GLASS PACKING NUTS**, then tighten 1/2 turn more by wrench. Tighten only enough to prevent leakage. **DO NOT OVER TIGHTEN!** If any leakage should occur, tighten slightly, a quarter turn at a time, checking for leakage after each turn.
8. Reinstall **GUARD RODS.**



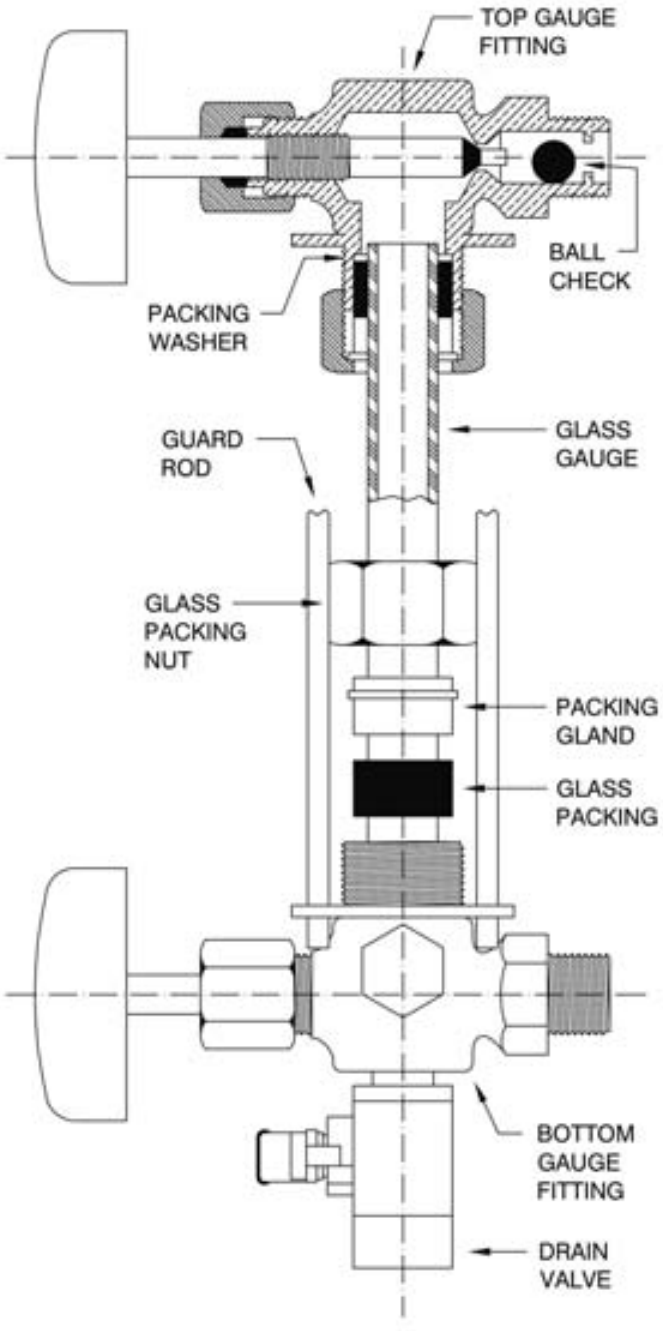
3.4) REPLACING GLASS GAUGE & RUBBER WASHERS OR GLASS PACKINGS (Continued)

The **Sight Glass (#10)** gives the operator the ability to easily monitor the actual water level inside the chamber. If the **Sight Glass (#10)** gets clogged or is no longer functional, it can be very difficult to troubleshoot a problem.

3.4.2) BRASS SIGHT GLASS (SEISMIC)

GLASS GAUGE and **GLASS PACKINGS MUST** be replaced **EVERY SIX MONTHS**

The Seismic Sight Glass is equipped with **BALL CHECKS** in each **GAUGE FITTING**



INSTALLATION:

Only properly trained personnel should install and maintain water gauge glass and connections. Remember to wear safety gloves and glasses during installation. Before installing, make sure all parts are free of chips and debris.

1. Uninstall **GUARD RODS, GLASS GAUGE,** and **GLASS PACKINGS**. (you may need to rotate one of the **GAUGE FITTINGS** to remove **GLASS GAUGE**)
2. Slip a new **GLASS PACKINGS** on the new **GLASS GAUGE** about an inch from the bottom.
3. Now slip the following items through the top of **GLASS GAUGE** in the following order:
   - **PACKING GLAND** (facing down)
   - **GLASS PACKING NUT** (facing down)
   - **GLASS PACKING NUT** (facing up)
   - **PACKING GLAND** (facing up)
   - **GLASS PACKINGS** (inch down from top)
   - **PACKING WASHER**
4. Gently insert **GLASS GAUGE** into **GAUGE FITTINGS**. You may need to rotate **GAUGE FITTINGS** until vertically aligned, after **GLASS GAUGE** is in.
5. Carefully raise **GLASS GAUGE** about 1/16” from bottom and slide lower **GLASS PACKINGS** down until it makes contact with the **BOTTOM GAUGE FITTING**. (**DO NOT** allow **GLASS GAUGE** to remain in contact with any metal)
6. Carefully slide upper **GLASS PACKINGS** up as far as possible.
7. Hand tighten both **GLASS PACKING NUTS**, then tighten 1/2 turn more by wrench. Tighten only enough to prevent leakage. **DO NOT OVER TIGHTEN!** If any leakage should occur, tighten slightly, a quarter turn at a time, checking for leakage after each turn.
8. Reinstall **GUARD RODS.**

3.5) CHAMBER CHEMICAL/ACID TREATMENT

All Electric Steam Generator should be cleaned regularly. The following is the least amount of times recommended to clean out your chamber:

NORMAL WATER AREAS – Should be done **ONCE A YEAR**.
BAD WATER AREAS – Should be done **TWICE A YEAR**.

If equipped with Motorized Auto-Flush & Drain "MAFD" (#20), locate the **MAFD TIMER/RELAY** in the **Control Panel (#1)** and do steps 1-3 before the chamber treatment and steps 4-5 after chamber treatment is done:

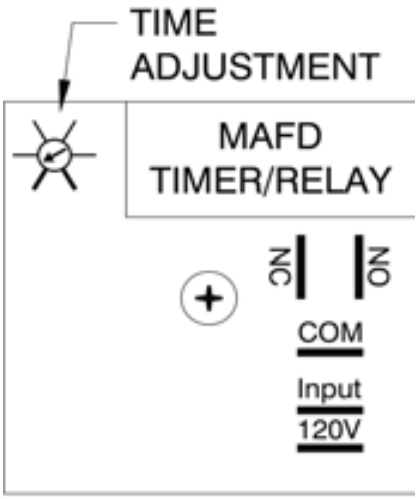
WARNING – Before opening **Control Panel (#1)**, **TO AVOID ELECTRICAL SHOCK**, place main disconnect box and the **Toggle Switch (#2)** in the **OFF** position.

BEFORE:

1. Dial **TIME ADJUSTMENT** on **MAFD TIMER/RELAY** all the way down to 15 seconds.
2. Make sure **MAFD (#20)** in the closed position.
3. Disconnect the orange wire from the normally open **(NO)** terminal on the **MAFD TIMER/RELAY**.

AFTER:

4. Reconnect the orange wire to the normally open **(NO)** terminal on the **MAFD TIMER/RELAY**.
5. Dial **TIME ADJUSTMENT** on **MAFD TIMER/RELAY** up to the desired flush time (Most commonly 3 minutes)



Chamber Treatment Instructions:

1. Turn on generator, allowing pressure to climb to **10** to **20 PSI** on **Pressure Gauge (#15)**, and then shut off.

2. **"Blow Down"** Open **Manual Drain (#19)** slowly, allowing **HOT WATER** and **STEAM** to blow out into the drain.

NOTE: You may Blow Down your generator at any pressure you feel comfortable with. **10 to 20 PSI** is only a recommendation. You may go higher or lower, but higher is always better.

WARNING – **HOT WATER** and **STEAM** under **HIGH PRESSURE** can lift drain pipes right off the ground and cause **SERIOUS INJURY**. Make sure drain pipe is **SECURE** and **CANNOT** move. The drain must be directed into a **HIGH TEMPERATURE** drain **(NO PVC).**

3. Remove **Safety Valve (#18)**.

WARNING – There **MUST** be **NO PRESSURE** in the chamber when removing the Safety Valve, make sure the steam out and drain are open to assure chamber will remain depressurized. Be cautious of escaping steam from chamber while Safety Valve is removed.

3.5) CHAMBER CHEMICAL/ACID TREATMENT (Continued)

4. Close **Manual Drain (#19)** and **Steam Out (#16)**; turn generator on until **Sight Glass (#10)** shows that it is 1/2 full, and then shut off.
5. Insert funnel into coupling, where **Safety Valve (#18)** used to be.
6. Pour a **1 Gallon** of hydrochloric acid (inhibited) solution **(NON-FOOD APPLICATIONS)** into funnel very slowly, being careful of fumes and venting while pouring.

NOTE: Solution can be obtained from any industrial chemical dealer.
FOR FOOD APPLICATIONS: Use FDA approved chemicals.

7. Remove funnel, reinstall **Safety Valve (#18)**, and verify **Steam Out (#16)** is closed; let solution set in generator for **1 HOUR.**
8. Turn on generator, allowing pressure to climb to **5 PSI** on **Pressure Gauge (#15)**, and then shut off.
9. Allow the pressure to drop to 0 PSI on **Pressure Gauge (#15)** naturally. **DO NOT** open **Steam Out (#16)** or **Manual Drain (#19)** until pressure is down.
10. Remove **Safety Valve (#18)**.
11. Reinsert funnel, and fill generator completely to the top with clean water; let stand for an additional **1/2 HOUR**.

NOTE: Turning on the generator will not completely fill it to the top. Filling must be done manually through the safety valve coupling.

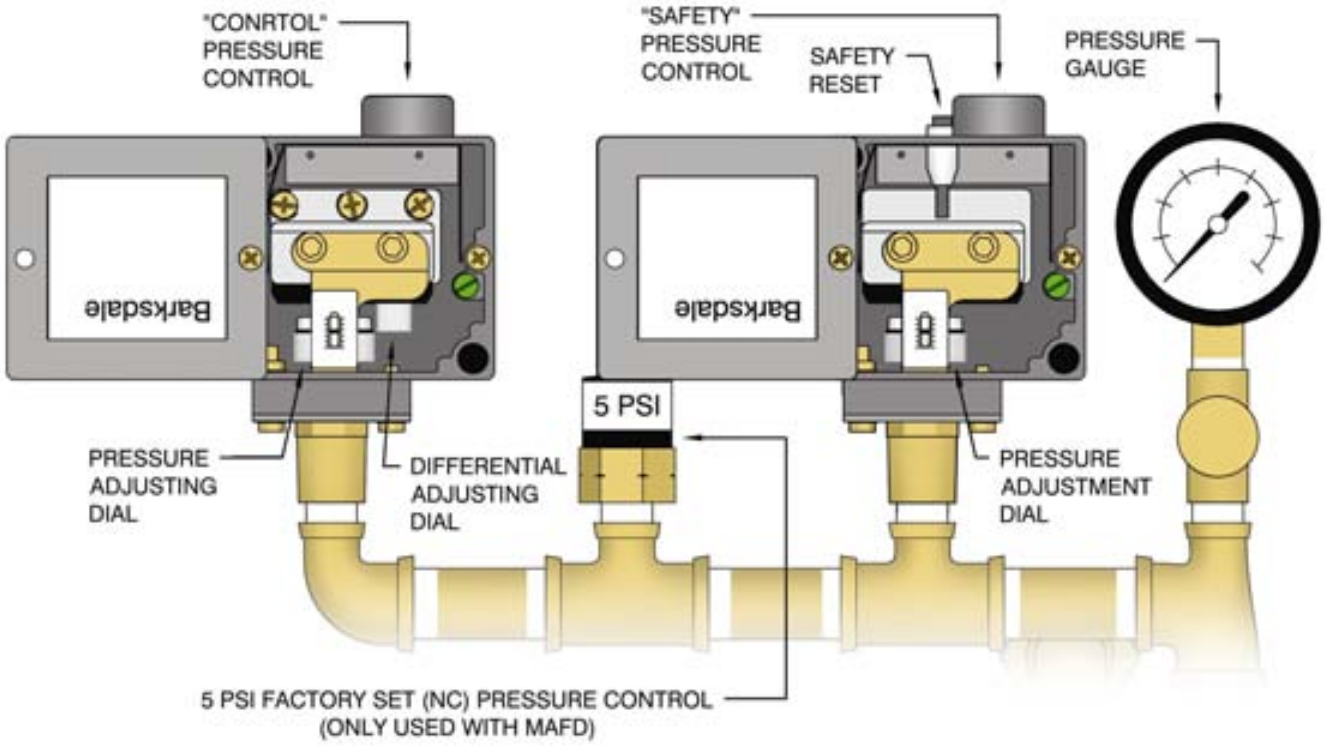
12. Open **Manual Drain (#19)** to drain generator.
13. Close **Manual Drain (#19)**; refill generator completely to the top with clean water and open **Manual Drain (#19)** to flush out generator completely.
14. Reinstall Safety Valve (#18) and close **Manual Drain (#19)**.
15. Turn on generator, allowing pressure to climb to **10 to 20 PSI** on **Pressure Gauge (#15)**, and then shut off.
16. **"Blow Down"** Open **Manual Drain (#19)** slowly, allowing **HOT WATER** and **STEAM** to blow out into the drain.

NOTE: You may Blow Down your generator at any pressure you feel comfortable with. **10** to **20 PSI** is only a recommendation. You may go higher or lower, but higher is always better.

WARNING – **HOT WATER** and **STEAM** under **HIGH PRESSURE** can lift drain pipes right off the ground and cause **SERIOUS INJURY**. Make sure drain pipe is **SECURE** and **CANNOT** move. The drain must be directed into a **HIGH TEMPERATURE** drain **(NO PVC)**.

17. Your generator is now ready for normal use and operation.

3.6) PRESSURE CONTROL DATA SHEET



DEFINITIONS:

"CONROL" PRESSURE CONTROL – This pressure control should be the only one controlling the operating pressure of the generator.

"SAFETY" PRESSURE CONTROL – This pressure control is only used if the "Control" fails. It is always set higher than the "Control"; if the operating pressure is passed, The "Safety" will turn the heaters off.

SAFETY RESET – This reset is tripped when the "Safety" turns the heaters off. It must be manually pushed to turn the heaters back on. This lets the user know there was a problem. If it is tripped, the "Control" most likely failed.

PRESSURE ADJUSTING DIAL – These dials adjust the set pressure at which each pressure control will turn the heaters off.

DIFFERENTIAL ADJUSTING DIAL – This dial is only on the "Control". When the "Control" turns the heaters off, the amount of pressure that is dropped before it turns the heaters back on (the differential) can be adjusted by this dial**.** This dial should never have to be adjusted, unless desired.

PRESSURE GAUGE – This tells the user what pressure is in the chamber. The pressure controls are set to this gauge.

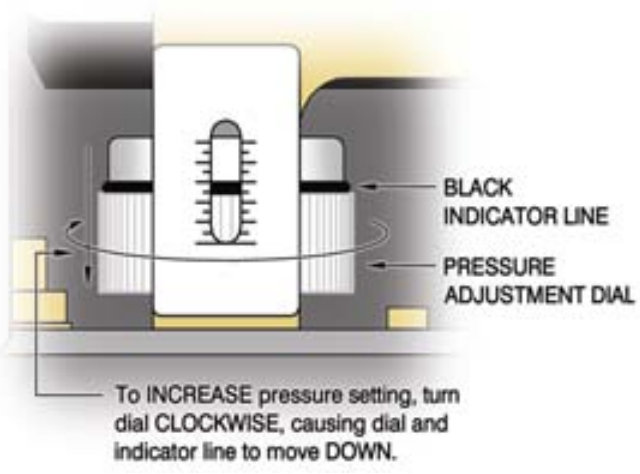
5 PSI PRESSURE CONTROL – (Only used with "MAFD" Motorized Auto-Flush & Drain) this control prevents the MAFD from opening when there is more than 5 pounds off pressure in the generator.

3.7) SETTING THE PRESSURE CONTROLS

WARNING – The pressure controls must be set while all circuits are live. **TO AVOID ELECTRICAL SHOCK**, **DO NOT TOUCH** the wires or the terminals in which they connect while setting the pressure controls.

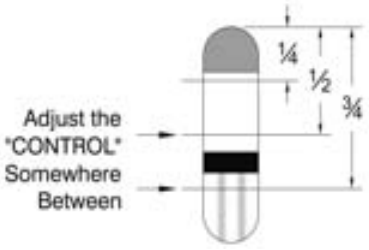
NOTES:

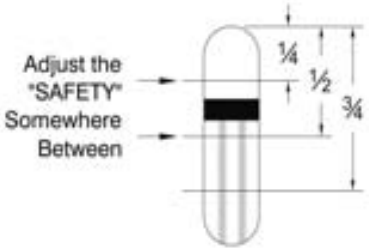
- Setting the pressure controls greatly relies on your ability to tell whether the contactor(s) are turning the heaters on or off. You should be able to hear the contactor(s), located inside the **Electrical Box (#1)**, click on and off. Familiarize yourself with this sound.
- The order in which the pressure controls must be set is the "Safety" and then the "Control".
- In order to set the "Safety" you must keep the "Control" at a higher pressure setting than the "Safety"
- Once the "Safety" is set, then you can lower the "Control" to its correct setting.
- To **INCREASE** the pressure setting, when looking down on pressure control, using your two index fingers, turn the **PRESSURE ADJUSTMENT DIAL CLOCKWISE**, causing the **BLACK INDICATOR LINE** to move **DOWN** the scale.
- To **DECREASE** the pressure setting, turn the dial **COUNTER CLOCKWISE**, causing the indicator line to move **UP** the scale.


BLACK INDICATOR LINE
PRESSURE ADJUSTMENT DIAL
To INCREASE pressure setting, turn dial CLOCKWISE, causing dial and indicator line to move DOWN.

SETTING INSTRUCTIONS:

1. Open the pressure control covers, as shown on previous page.
2. Adjust the **PRESSURE ADJUSTMENT DIAL** on the "**CONTROL**" so that the **BLACK INDICATOR LINE** is somewhere between ½ and ¾ of the way down from the top.
3. Adjust the **PRESSURE ADJUSTMENT DIAL** on the "**SAFETY**" so that the **BLACK INDICATOR LINE** is somewhere between ¼ and ½ of the way down from the top.
4. Close the **Steam Out (#16)** and turn on generator. When the contactor(s) click on, the pressure will rise. If contactor(s) do not click on right away, you may need to press **SAFETY RESET**. Continue to watch the **Pressure Gauge (#15)** until you hear the contactor(s) click off. This may take up to 20 minutes.





WARNING – **DO NOT** allow the pressure to exceed the rating on the **Safety Valve (#18)**. If contactor(s) do not turn off before the pressure limit is exceeded, manually shut off generator, open the **Steam Out (#16)**, and **DECREASE** the pressure setting on the "**SAFETY**" pressure control. Repeat step #4.

3.7) SETTING THE PRESSURE CONTROLS (Continued)

5. At this point the contactor(s) should be clicked off and you should be able to click them on and then off again by pressing the **SAFETY RESET**. This is a way to test if the "**SAFETY**" is still controlling the pressure, and not the **"CONTROL"**. While setting the "**SAFETY**" and the contactor(s) are off, if the **SAFETY RESET** does not cause the contactor(s) to click on and off again, **INCREASE** the setting on the "**CONTROL**"

WARNING – **DO NOT** allow the pressure to exceed the rating on the **Safety Valve (#18)**. If contactor(s) do not turn off before the pressure limit is exceeded, manually shut off generator, open the **Steam Out (#16)**, and **DECREASE** the pressure setting on the "**SAFETY**" pressure control. If you cannot get the "**SAFETY**" to control the pressure, it may need to be replaced.

Pressure Control Settings		
	"Control"	**"Safety"**
High Pressure **(0-100 PSI)**	**80 PSI**	**85 PSI**
High Pressure **(0-30 PSI)**	**25 PSI**	**27 PSI**
Low Pressure **(0-15 PSI)**	**11 PSI**	**13.5 PSI**

6. Open the **Steam Out (#16)** to exhaust some pressure. Continue pressing the **SAFETY RESET** until the contactor(s) click on and remain on. The pressure should eventually begin to rise. If it doesn't, throttle the **Steam Out (#16)** somewhere between closed and open until it does.

7. Pay attention to what the pressure reads when the contactor(s) click off. If the pressure stopped **BELOW** the "**SAFETY PRESSURE SETTING**", then **INCREASE** the pressure setting on the "**SAFETY"**. If the pressure stopped **ABOVE**, then **DECREASE** the pressure setting.

8. Continue to watch the pressure go up and down, while adjusting the "**SAFETY**" and pressing the **SAFETY RESET**, until the pressure stops at the proper "**SAFETY PRESSURE SETTING**".

9. At this point the "**SAFETY**" should be set to the proper "**SAFETY PRESSURE SETTING**", and the "**CONTROL**" should be set somewhere above the "**SAFETY**".

10. Let the pressure drop below the "**OPERATING PRESSURE SETTING**" and then press the **SAFETY RESET**, so that the contactor(s) click on. **DECREASE** the pressure setting on the "**CONTROL**" until the contactor(s) click off.

11. Repeat Step 10 until you no longer need to press the **SAFETY RESET** for the contactor(s) to click on.

12. Continue to watch the pressure go up and down, while adjusting the "**CONTROL**", until the pressure stops at the proper "**OPERATING PRESSURE SETTING**".

13. The Pressure Controls are now set.

NOTE: If at anytime the **SAFETY RESET** needs to be pressed after the pressure controls are set, either one of the controls are bad, the "**SAFETY**" is set too low, or the "**CONTROL**" is set too high.

4.) CALCULATIONS AND DATA SHEETS

4.1) HEATER POWER & VOLTAGE RATINGS

LB 100 thru 240 Model units use 4 or 6 heaters to meet the required **(KW) POWER** from the customer's specified **INPUT VOLTAGE**. Each heater comes in 3 different **(KW) POWER RATINGS** and 4 different **VOLTAGE RATINGS**

HEATER VOLTAGE RATINGS per INPUT VOLTAGE (VOLTS)														
Input Voltage	**208**	**220**	**230**	**240**	**380**	**400**	**415**	**425**	**440**	**460**	**480**	**550**	**575**	**600**
LB 100-240	208	230	230	230	208	230	230	230	480	480	480	600	600	600

NOTE: 380-425V heaters are not usually rated for 380-425V. They are usually 208-240V heaters that have been re-stamped 380-425V and jumpered in series.

AVAILABLE HEATER RATINGS				
KW	**VOLTAGES**			
25	208	230	480	600
30	208	230	480	600
40	208	230	480	600

POWER RATINGS per MODEL		
MODEL UNIT	**QUAN.**	**KW**
LB-100	4	25
LB-120	4	30
LB-150	6	25
LB-180	6	30
LB-240	6	40

4.2) AMPERAGE CALCULATIONS

The **INPUT VOLTAGE, PHASE, TOTAL POWER RATING,** and **HEATER VOLTAGE RATING** are used to calculate the amperage.

THREE PHASE AMPERAGE FORMULAS	
208-240V & 440-600V	**380-425V (using 208-240V heaters)**
$I = \frac{P_T V_I}{V_H^2 \sqrt{3}}$	$I = \frac{P_T V_I}{(\sqrt{3} V_H)^2 \sqrt{3}}$

DEFINITIONS:

I = Amperage

P_T = Total Power Rating

V_I = Input Voltage

V_H = Heater Voltage Rating

4.2) AMPERAGE CALCULATIONS (Continued)

THREE PHASE AMPERAGE CALCULATIONS (AMPS)														
Input Voltage	**208**	**220**	**230**	**240**	**380**	**400**	**415**	**425**	**440**	**460**	**480**	**550**	**575**	**600**
LB-100	278	240	251	262	169	146	151	155	110	115	120	88	92	96
LB-120	333	288	301	314	203	175	181	186	132	138	144	106	111	115
LB-150	416	360	377	393	254	218	226	232	165	173	180	132	138	144
LB-180	500	432	452	471	304	262	272	278	198	207	217	159	166	173
LB-240	666	576	602	629	406	349	362	371	265	277	289	212	221	231

4.3) ACTUAL POWER RATING CALCULATIONS

Because the **HEATER VOLTAGE RATINGS** only come in 4 different voltages, and there are so many different voltages in the field, the **TOTAL POWER RATING** is only completely accurate if the **VOLTAGE IN** is exactly equal to the **HEATER VOLTAGE RATING**. This means, in most cases, the **TOTAL POWER RATING** is not completely accurate. The **AMERAGE** and **INPUT VOLTAGE** can be used to calculate the **ACTUAL POWER RATING**.

THREE PHASE ACTUAL POWER RATINGS FORMULA

$$P_A = I\, V_I \sqrt{3}$$

DEFINITIONS:

P_A = Actual Power Rating **I = Amperage**

V_I = Input Voltage

ACTUAL POWER RATING CALCULATIONS (KW)														
Input Voltage	**208**	**220**	**230**	**240**	**380**	**400**	**415**	**425**	**440**	**460**	**480**	**550**	**575**	**600**
LB-100	100	91.5	100	109	111	101	109	114	84	91.8	100	84	91.8	100
LB-120	120	110	120	131	134	121	130	137	101	110	120	101	110	120
LB-150	150	137	150	163	167	151	163	171	126	138	150	126	138	150
LB-180	180	165	180	196	200	182	195	205	151	165	180	151	165	180
LB-240	240	220	240	261	267	242	261	273	202	220	240	202	220	240

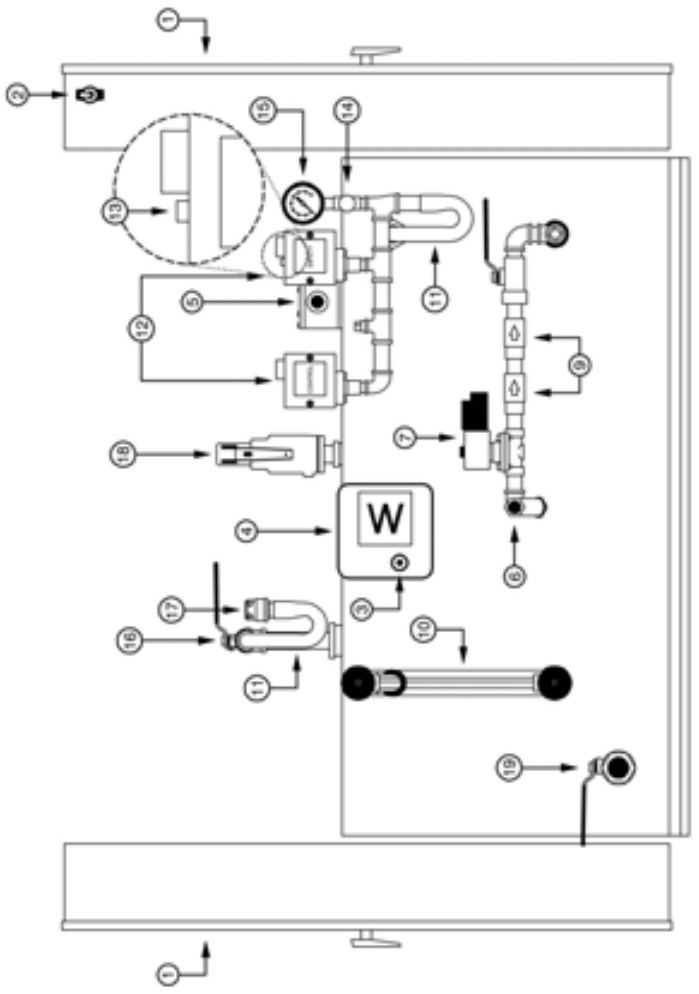
4.4) STEAM CAPACITY CALCULATIONS

Steam Capacity Calculations are based on the impossible feed water temperature of 212°F.
WARNING – Anything above 140°F will cause damage to water solenoid and pump.

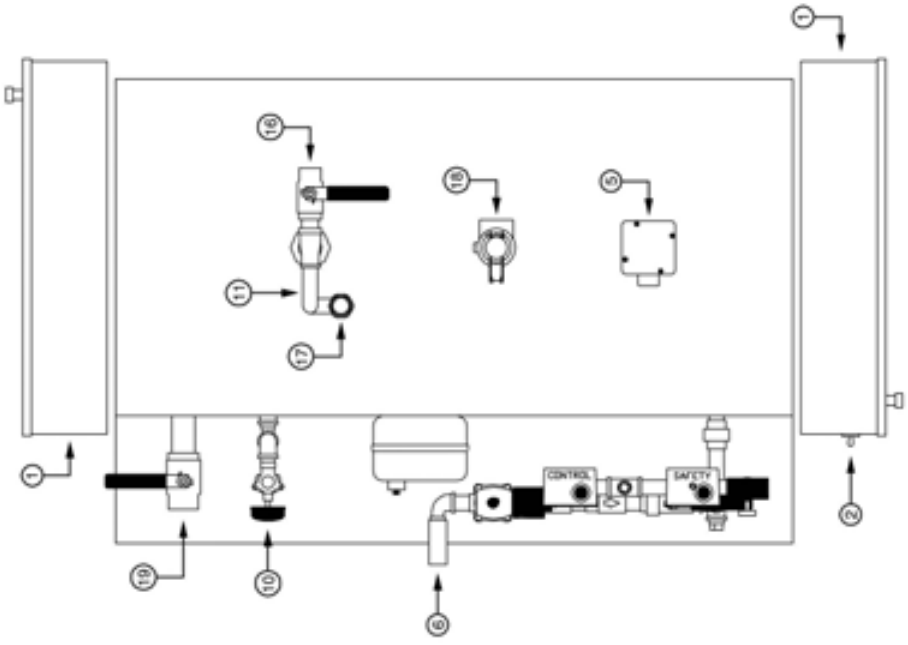
NET STEAM CAPACITY CALCULATIONS				
MODEL UNIT	Feed Water @ **212°F**	Feed Water @ **140°F** **90%** of **212°F**	Feed Water @ **100°F** **80%** of **212°F**	Feed Water @ **60°F** **75%** of **212°F**
LB-100	**345.0** LB/hr **156.5** Kg/hr	**310.5** LB/hr **140.8** Kg/hr	**276.0** LB/hr **125.2** Kg/hr	**258.8** LB/hr **117.4** Kg/hr
LB-120	**414.0** LB/hr **187.8** Kg/hr	**372.6** LB/hr **169.0** Kg/hr	**331.2** LB/hr **150.2** Kg/hr	**310.5** LB/hr **140.8** Kg/hr
LB-150	**518.0** LB/hr **235.0** Kg/hr	**466.2** LB/hr **211.5** Kg/hr	**414.4** LB/hr **188.0** Kg/hr	**388.5** LB/hr **176.2** Kg/hr
LB-180	**621.0** LB/hr **281.7** Kg/hr	**558.9** LB/hr **253.5** Kg/hr	**496.8** LB/hr **225.3** Kg/hr	**465.8** LB/hr **211.3** Kg/hr
LB-240	**828.0** LB/hr **375.6** Kg/hr	**745.2** LB/hr **338.0** Kg/hr	**662.4** LB/hr **300.5** Kg/hr	**621.0** LB/hr **281.7** Kg/hr

PARTS LEGEND - LB 100-240 (L)

1.) Control Boxes
2.) ON/OFF Switch
3.) Manual Low-Water Reset (MLWR) (Optional)
4.) Dual Function Board w/ Enclosure
5.) Water Level Probes
6.) Water Inlet - 1/2" Y-Strainer
7.) 1/2" Water Solenoid
9.) 1/2" Check Valves
10.) 5/8" x 10 1/2" Sight Glass (Seismic Optional)
11.) Water Barrier - 1/2" U-Tube
12.) 0-15 PSI Pressure Controls
13.) Reset on "Safety" Pressure Switch
14.) 1/4" Needle Valve
15.) 0-30 PSI Pressure Gauge
16.) Steam Out - 3/4" Ball Valve
17.) 1/2" Vacuum Relief Valve
18.) Safety Relief Valve
19.) Drain - 1" Ball Valve



SIDE VIEW



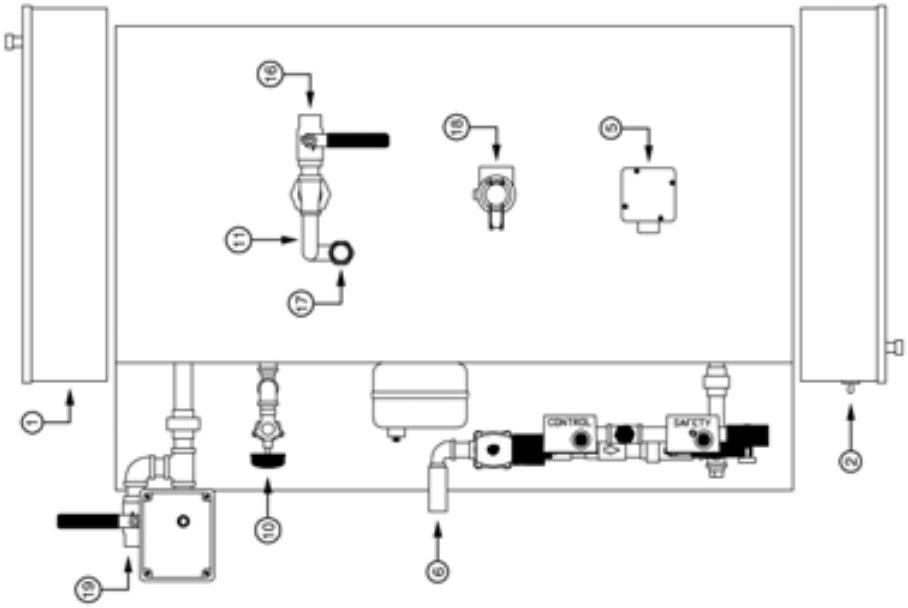
TOP VIEW

DRAWING TITLE	(PARTS LEGEND) LB 100-240 (L)	MODEL UNIT	LB 100-240	ELECTRO-STEAM GENERATOR CORP.	
DESCRIPTION	DRAWN BY	CHRISTOPHER FERRARA	05.07.07	50 Indel Ave. P.O. Rancocas, NJ 08073-0455	
LOW PRESSURE	CHECKED	SAL MUSSO	05.07.07		
-	ENGINEER	CHRISTOPHER FERRARA	05.07.07	DWG NO. 311-100-240-000100	SCALE: N/A
-	APPROVED	JOHN PARONE	05.07.07		SHEET 1 OF 1

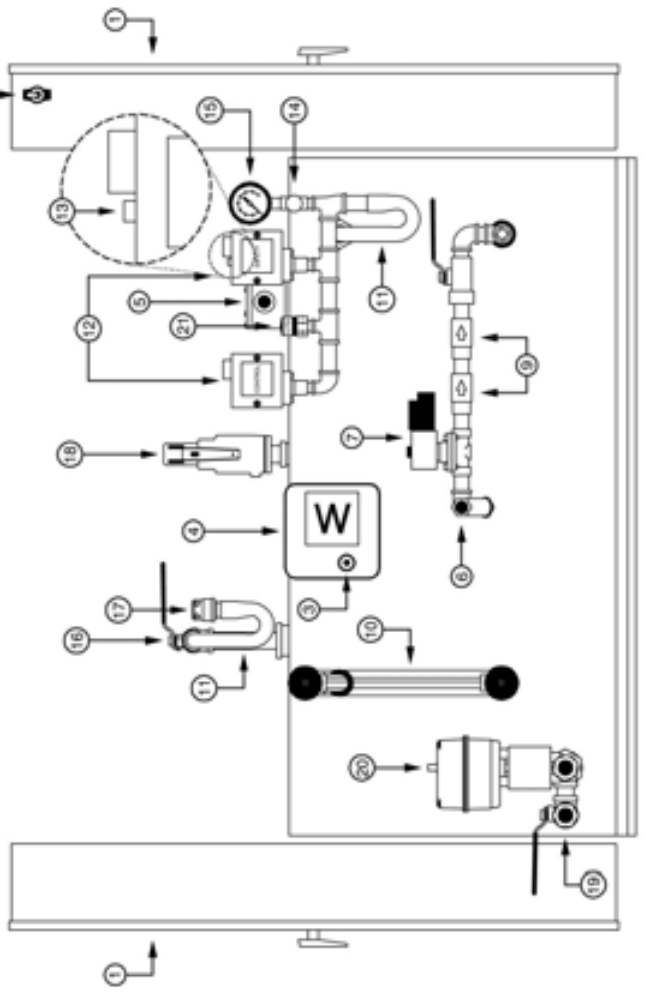
This drawing and all information therein are the property of Electro-Steam Generator Corp. and shall not be disclosed, in whole or in part, to any third party without prior permission of Electro-Steam Generator Corp.

PARTS LEGEND - LB 100-240 (L)(MAFD)

1.) Control Boxes
2.) ON/OFF Switch
3.) Manual Low-Water Reset (MLWR) (Optional)
4.) Dual Function Board w/ Enclosure
5.) Water Level Probes
6.) Water Inlet - 1/2" Y-Strainer
7.) 1/2" Water Solenoid
9.) 1/2" Check Valves
10.) 5/8" x 10 1/2" Sight Glass (Seismic Optional)
11.) Water Barrier - 1/2" U-Tube
12.) 0-15 PSI Pressure Controls
13.) Reset on "Safety" Pressure Switch
14.) 1/4" Needle Valve
15.) 0-30 PSI Pressure Gauge
16.) Steam Out - 3/4" Ball Valve
17.) 1/2" Vacuum Relief Valve
18.) Safety Relief Valve
19.) Manual Drain - 3/4" Ball Valve
20.) Motorized Auto-Flush & Drain (MAFD) (Optional)
21.) 5 PSI (NC) Pressure Switch for (MAFD)



TOP VIEW



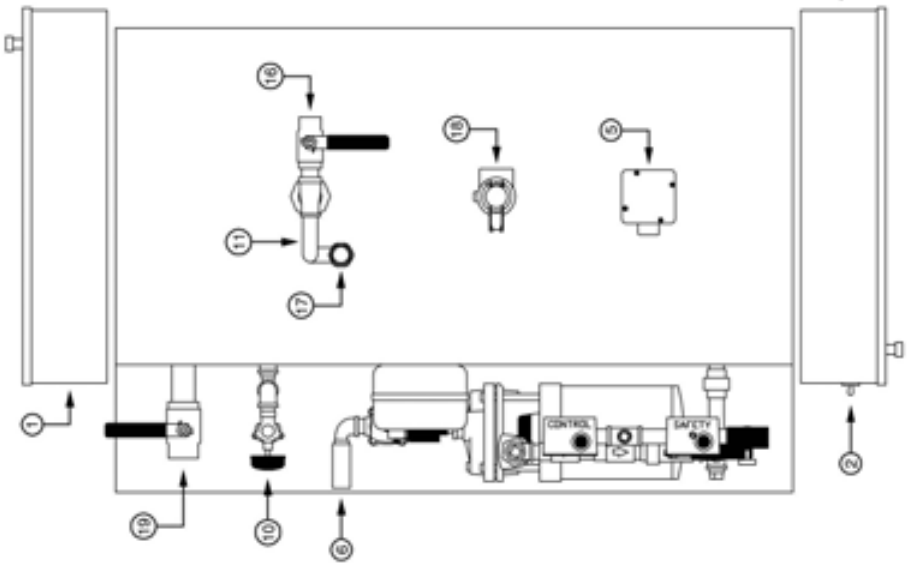
SIDE VIEW

DRAWING TITLE: (PARTS LEGEND) LB 100-240 (L)(MAFD)		MODEL UNIT: LB 100-240	ELECTRO-STEAM GENERATOR CORP.
DESCRIPTION:	DRAWN BY: CHRISTOPHER FERRARA	05.07.07	
LOW PRESSURE	CHECKED: SAL NEGRO	05.07.07	50 Intell Ave, P.O. Pacocata, NJ 08073-0455
MOTORIZED AUTO-FLUSH & DRAIN	ENGINEER: CHRISTOPHER FERRARA	05.07.07	DWG NO: 311-100-240-000110
-	APPROVED: JOHN PARONE	05.07.07	SCALE: N/A SHEET: 1 OF 1

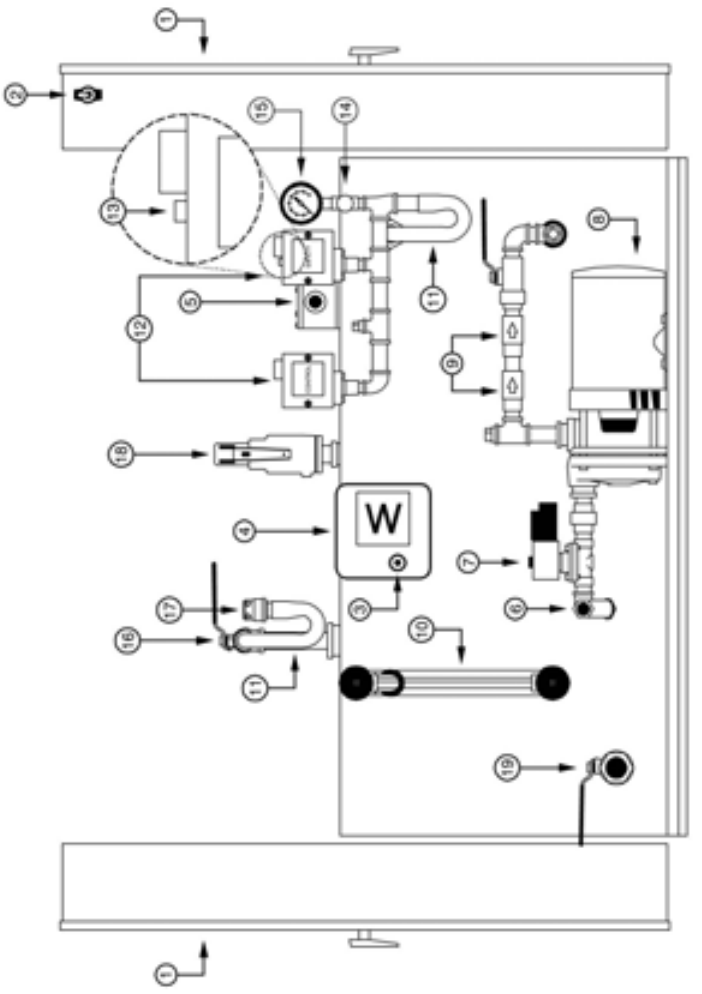
This drawing and all information therein are the property of Electro-Steam Generator Corp. and shall not be disclosed, in whole or in part, to any third party without prior permission of Electro-Steam Generator Corp.

PARTS LEGEND - LB 100-240 (H)

1.) Control Boxes
2.) ON/OFF Switch
3.) Manual Low-Water Reset (MLWR) (Optional)
4.) Dual Function Board w/ Enclosure
5.) Water Level Probes
6.) Water Inlet - 1/2" Y-Strainer
7.) 1/2" Water Solenoid
8.) 1/3 HP Pump & Motor
9.) 1/2" Check Valves
10.) 5/8" x 10 1/2" Sight Glass (Seismic Optional)
11.) Water Barrier - 1/2" U-Tube
12.) 0-90 PSI Pressure Controls
13.) Reset on "Safety" Pressure Switch
14.) 1/4" Needle Valve
15.) 0-160 PSI Pressure Gauge
16.) Steam Out - 3/4" Ball Valve
17.) 1/2" Vacuum Relief Valve
18.) Safety Relief Valve
19.) Drain - 1" Ball Valve



TOP VIEW



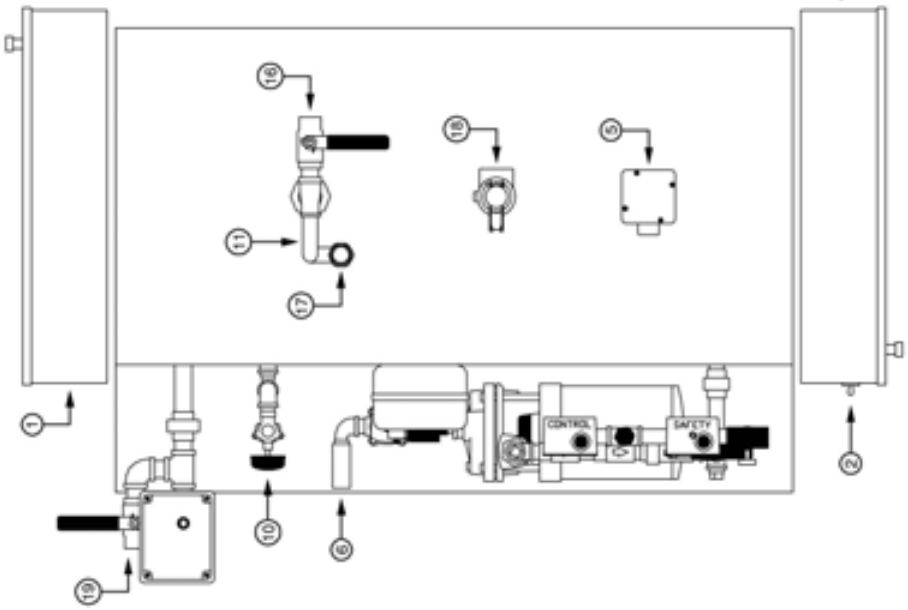
SIDE VIEW

DRAWING TITLE	(PARTS LEGEND) LB 100-240 (H)	MODEL UNIT	LB 100-240	ELECTRO-STEAM GENERATOR CORP.	
DESCRIPTION	DRAWN BY	CHRISTOPHER FERRARA	05.07.07	50 Indel Ave. P.O. Rancocas, NJ 08073-0455	
HIGH PRESSURE	CHECKED	SAL MUSSO	05.07.07		
-	ENGINEER	CHRISTOPHER FERRARA	05.07.07	DWG NO. 311-100-240-000200	SCALE: N/A
-	APPROVED	JOHN PARONE	05.07.07		SHEET 1 OF 1

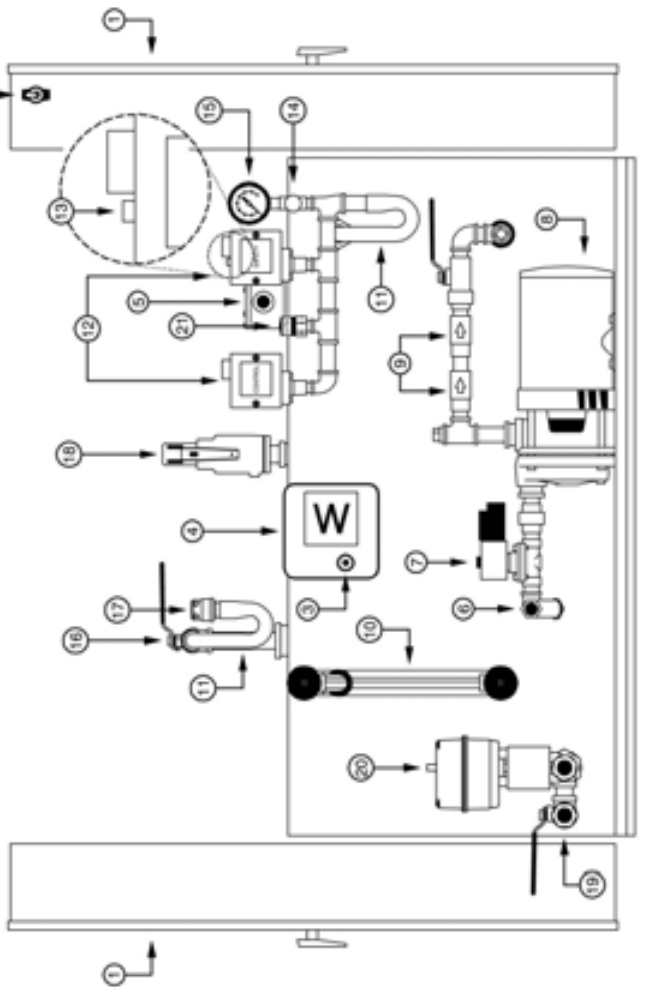
This drawing and all information therein are the property of Electro-Steam Generator Corp. and shall not be disclosed, in whole or in part, to any third party without prior permission of Electro-Steam Generator Corp.

PARTS LEGEND - LB 100-240 (H)(MAFD)

1.) Control Boxes
2.) ON/OFF Switch
3.) Manual Low-Water Reset (MLWR) (Optional)
4.) Dual Function Board w/ Enclosure
5.) Water Level Probes
6.) Water Inlet - 1/2" Y-Strainer
7.) 1/2" Water Solenoid
8.) 1/3 HP Pump & Motor
9.) 1/2" Check Valves
10.) 5/8" x 10 1/2" Sight Glass (Seismic Optional)
11.) Water Barrier - 1/2" U-Tube
12.) 0-90 PSI Pressure Controls
13.) Reset on "Safety" Pressure Switch
14.) 1/4" Needle Valve
15.) 0-160 PSI Pressure Gauge
16.) Steam Out - 3/4" Ball Valve
17.) 1/2" Vacuum Relief Valve
18.) Safety Relief Valve
19.) Manual Drain - 3/4" Ball Valve
20.) Motorized Auto-Flush & Drain (MAFD) (Optional)
21.) 5 PSI (NC) Pressure Switch for (MAFD)



TOP VIEW

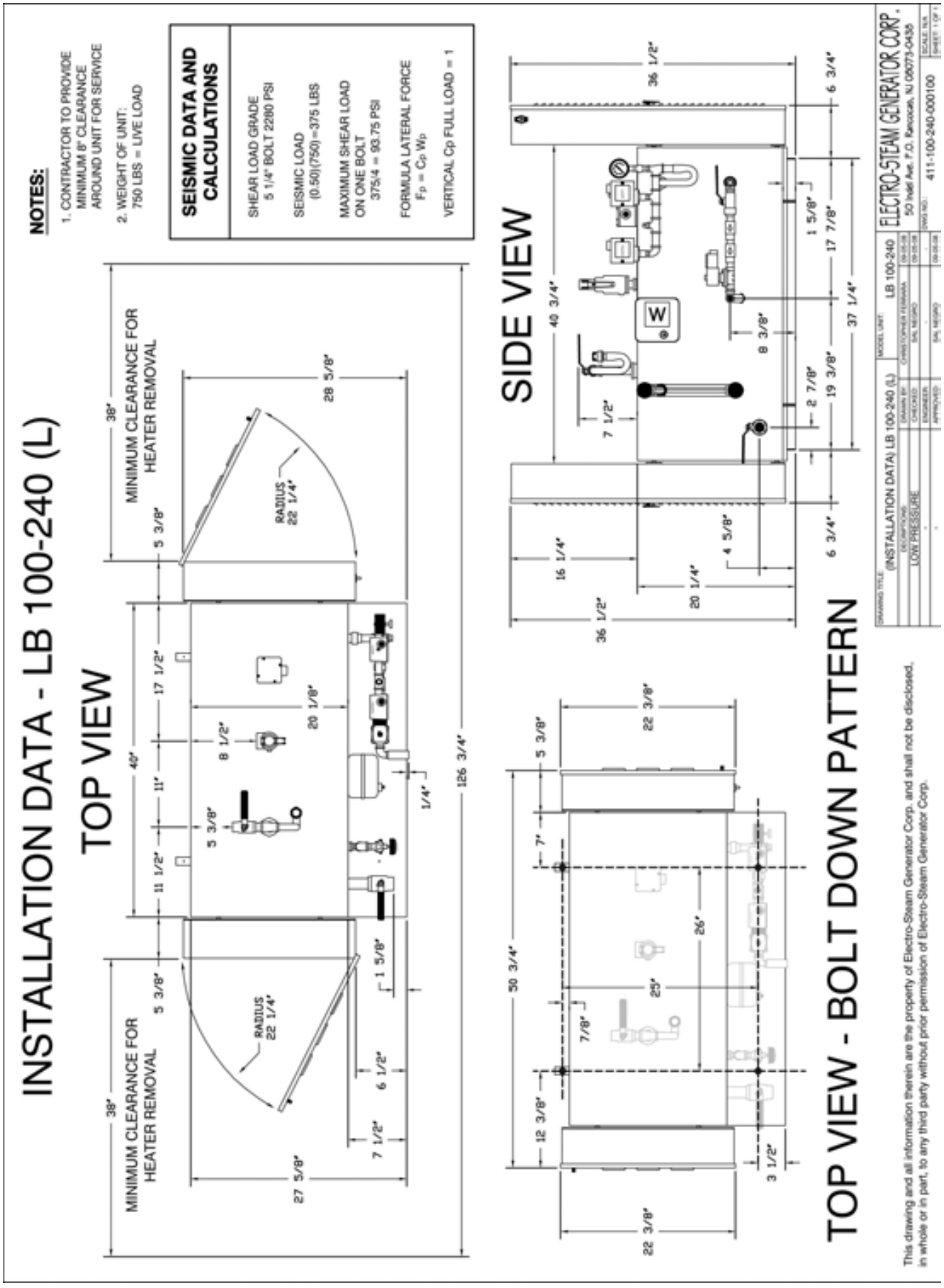


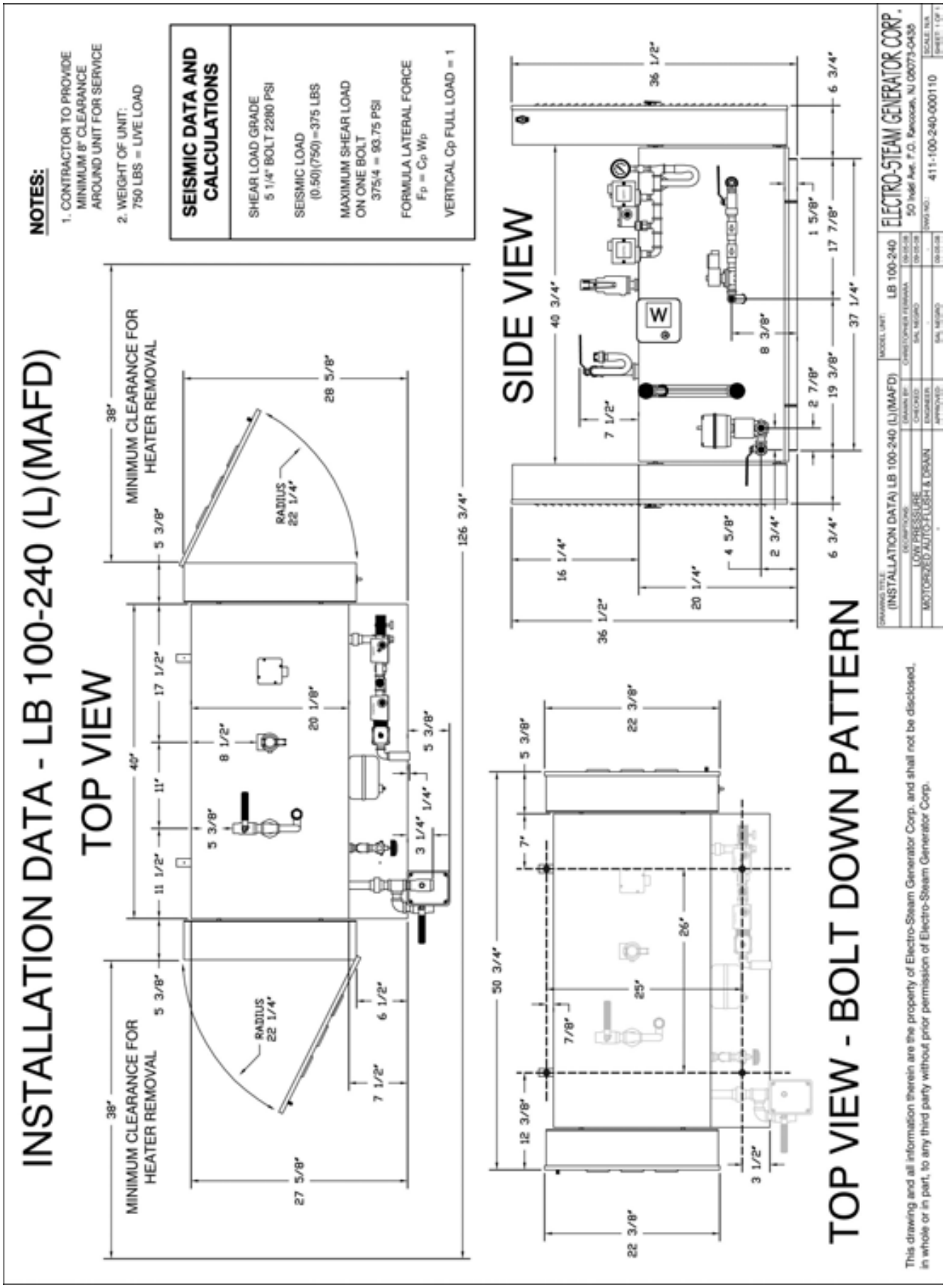
SIDE VIEW

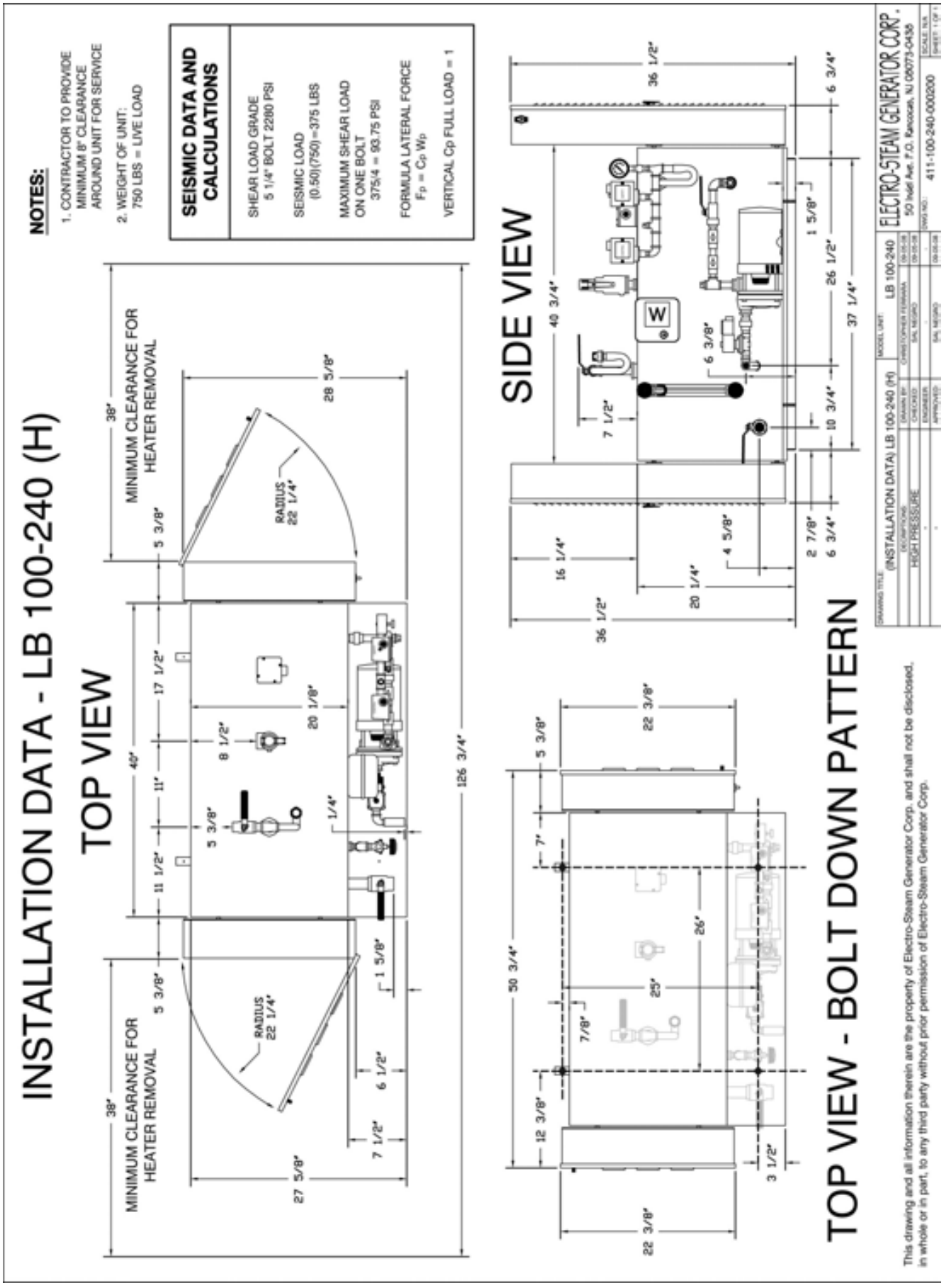
DRAWING TITLE: (PARTS LEGEND) LB 100-240 (H)(MAFD)		MODEL UNIT: LB 100-240	ELECTRO-STEAM GENERATOR CORP.
DESCRIPTION	DRAWN BY:	CHRISTOPHER FERRARA	05.07.07
HIGH PRESSURE	CHECKED	SAL MUSSO	05.07.07
MOTORIZED AUTO-FLUSH & DRAIN	ENGINEER	CHRISTOPHER FERRARA	05.07.07
-	APPROVED	JOHN PARONE	05.07.07

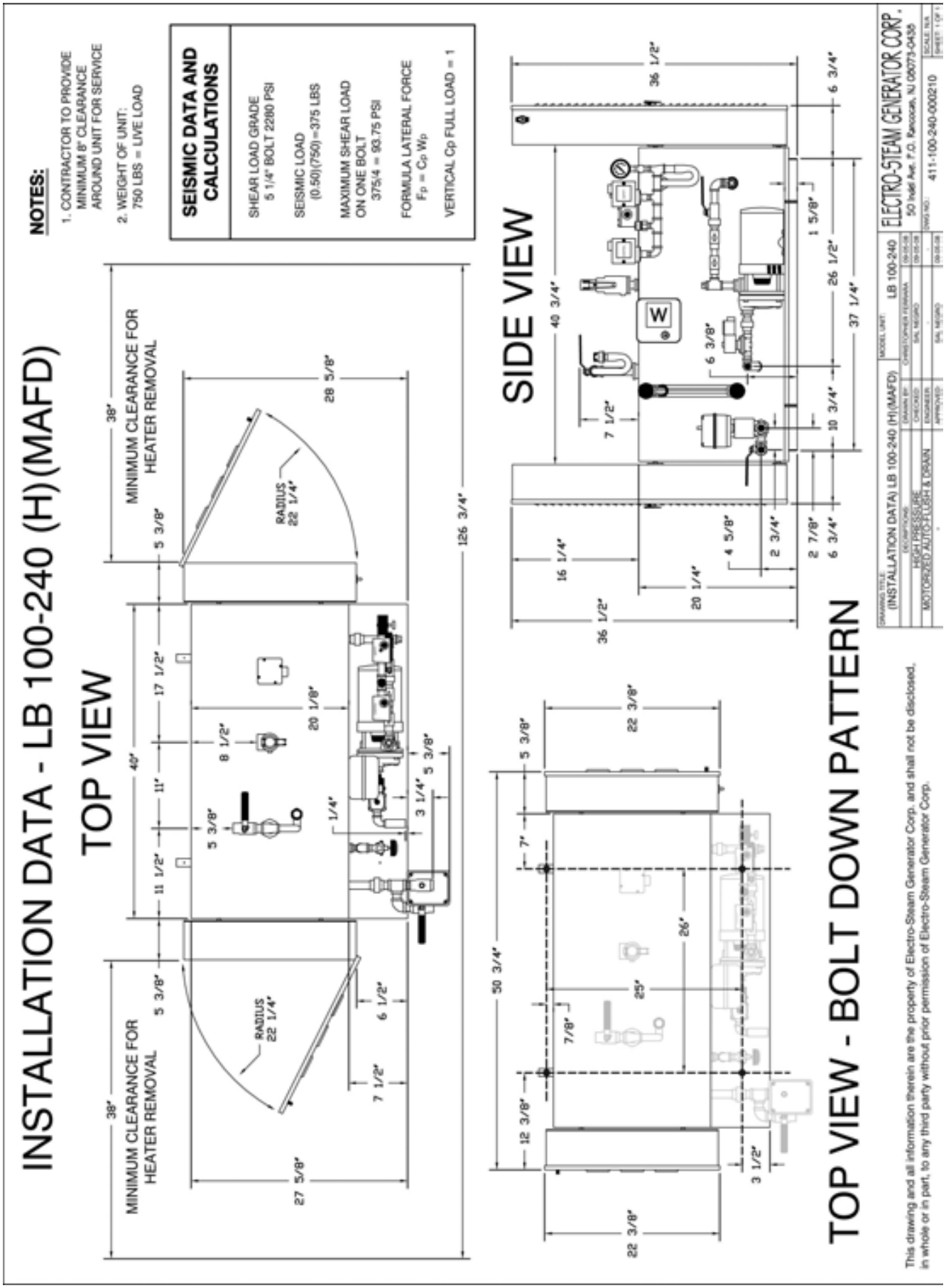
50 Intell Ave, P.O. Parsippany, NJ 07073-0456
DWG NO: 311-100-240-000210
SCALE: N/A
SHEET: 1 OF 1

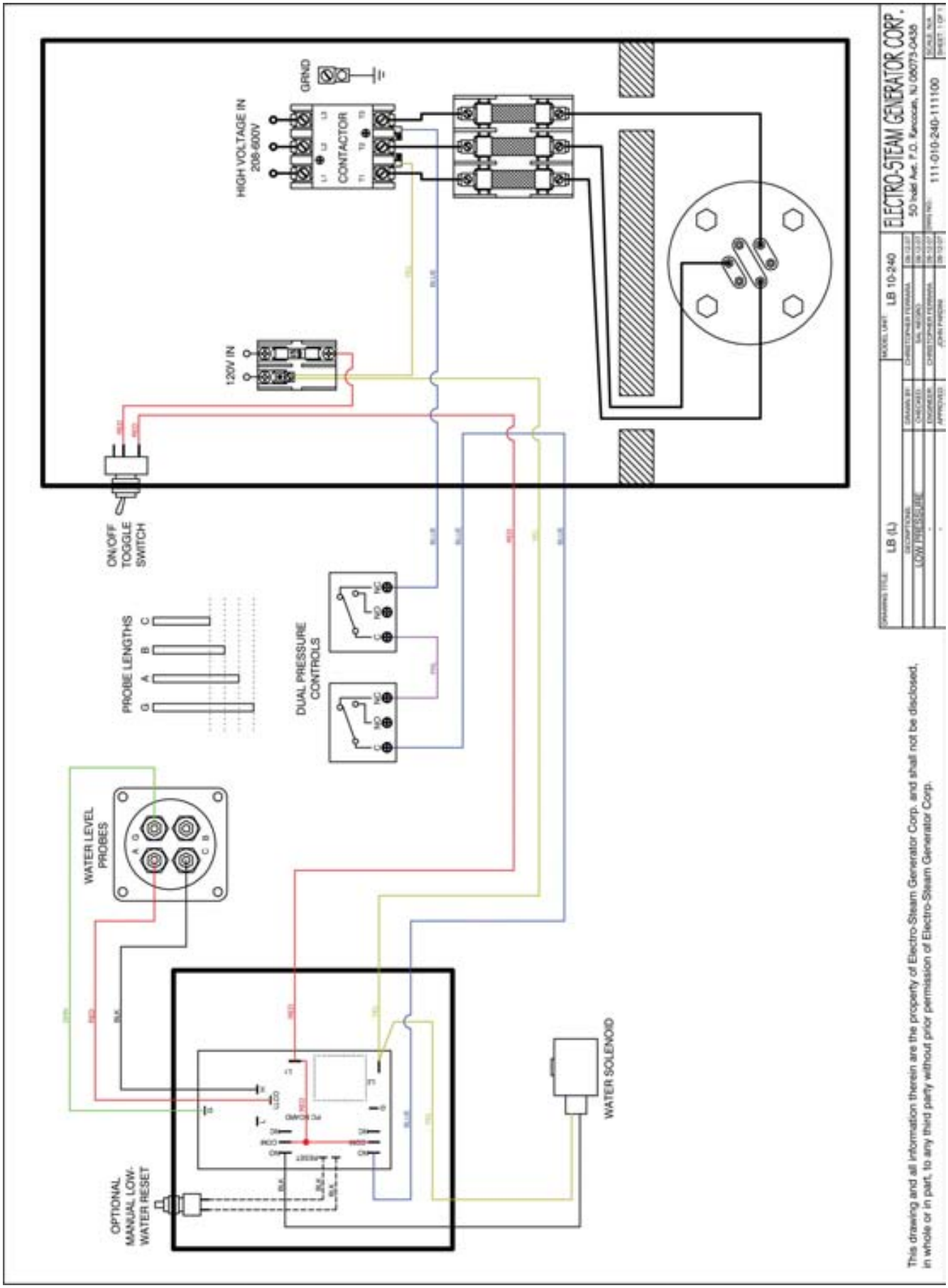
This drawing and all information therein are the property of Electro-Steam Generator Corp. and shall not be disclosed, in whole or in part, to any third party without prior permission of Electro-Steam Generator Corp.

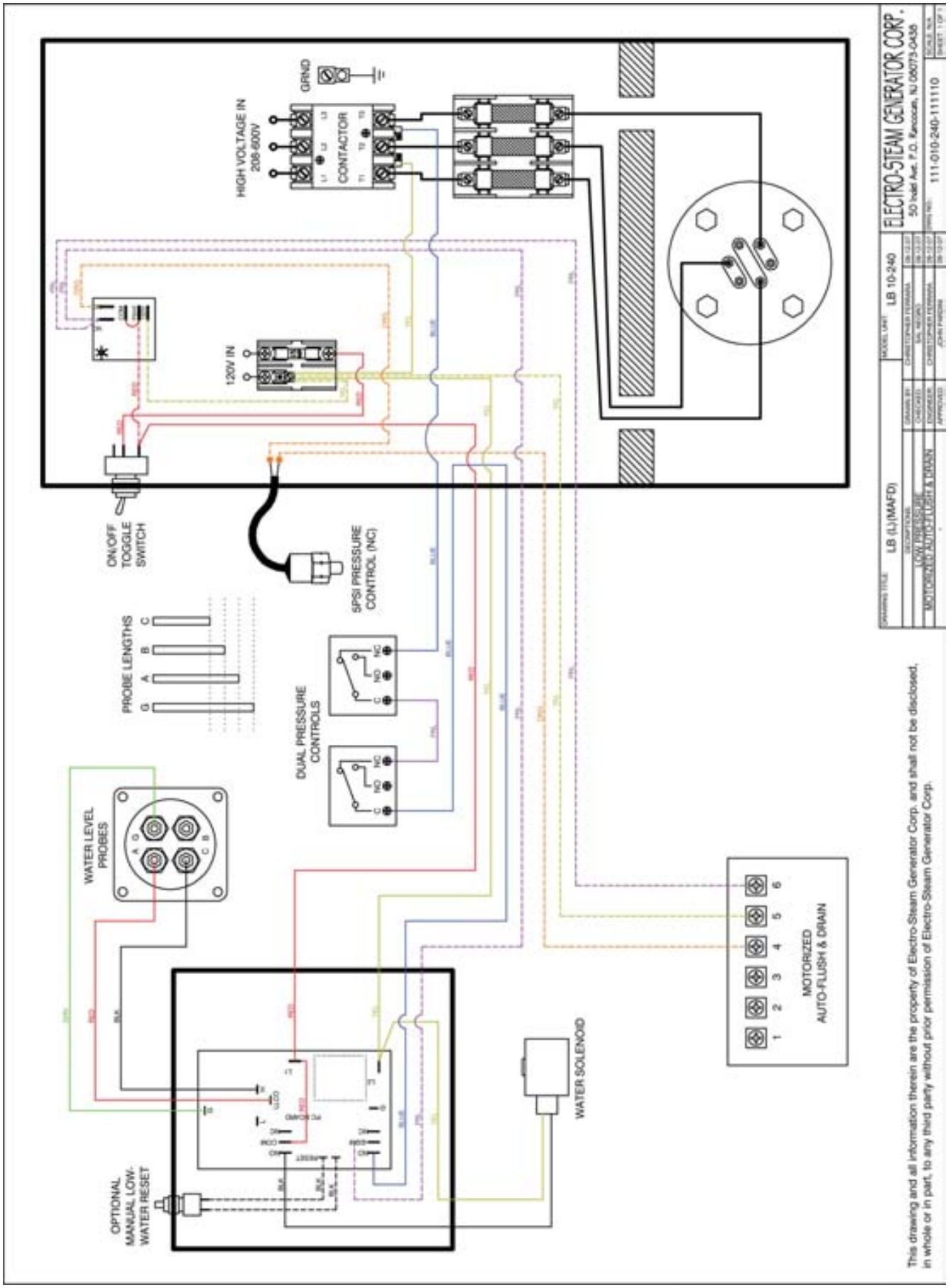

INSTALLATION DATA - LB 100-240 (L)
NOTES:
1. CONTRACTOR TO PROVIDE MINIMUM 8" CLEARANCE AROUND UNIT FOR SERVICE
2. WEIGHT OF UNIT: 750 LBS = LIVE LOAD
SEISMIC DATA AND CALCULATIONS
SHEAR LOAD GRADE 5 1/4" BOLT 2280 PSI
SEISMIC LOAD (0.50)(750) =375 LBS
MAXIMUM SHEAR LOAD ON ONE BOLT 375/4 = 93.75 PSI
FORMULA LATERAL FORCE Fp = Cp Wp
VERTICAL Cp FULL LOAD = 1
TOP VIEW
MINIMUM CLEARANCE FOR HEATER REMOVAL
38"
5 3/8"
40"
11 1/2"
11"
17 1/2"
RADIUS 22 1/4"
28 5/8"
20 1/8"
8 1/2"
5 3/8"
1/4"
126 3/4"
1 5/8"
6 1/2"
7 1/2"
27 5/8"
SIDE VIEW
40 3/4"
36 1/2"
16 1/4"
20 1/4"
4 5/8"
6 3/4"
7 1/2"
2 7/8"
19 3/8"
8 3/8"
1 5/8"
17 7/8"
37 1/4"
TOP VIEW - BOLT DOWN PATTERN
50 3/4"
12 3/8"
22 3/8"
5 3/8"
7"
25"
26"
7/8"
3 1/2"
DRAWING TITLE (INSTALLATION DATA) LB 100-240 (L)
MODEL UNIT LB 100-240
DESCRIPTION: LOW PRESSURE
DRAWN BY
CHECKED
ENGINEER
APPROVED
ELECTRO-STEAM GENERATOR CORP.
50 Intell Ave, P.O. Rancocas, NJ 08073-0455
DWG NO: 411-100-240-000100
SCALE: N/A
This drawing and all information therein are the property of Electro-Steam Generator Corp. and shall not be disclosed, in whole or in part, to any third party without prior permission of Electro-Steam Generator Corp.

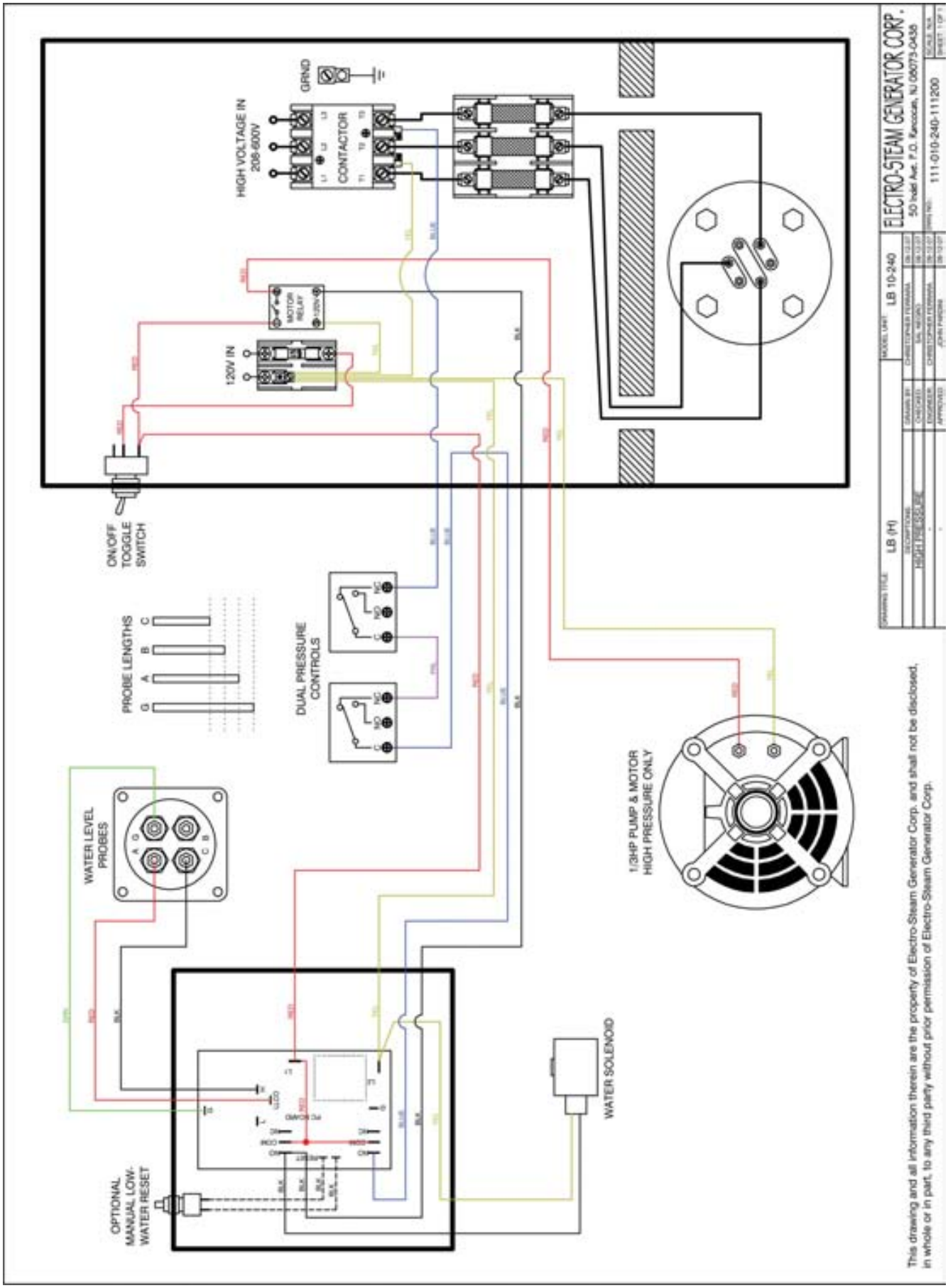

INSTALLATION DATA - LB 100-240 (L)(MAFD)
NOTES:
1. CONTRACTOR TO PROVIDE MINIMUM 8" CLEARANCE AROUND UNIT FOR SERVICE
2. WEIGHT OF UNIT: 750 LBS = LIVE LOAD
SEISMIC DATA AND CALCULATIONS
SHEAR LOAD GRADE 5 1/4" BOLT 2280 PSI
SEISMIC LOAD (0.50)(750) =375 LBS
MAXIMUM SHEAR LOAD ON ONE BOLT 375/4 = 93.75 PSI
FORMULA LATERAL FORCE Fp = Cp Wp
VERTICAL Cp FULL LOAD = 1
TOP VIEW
MINIMUM CLEARANCE FOR HEATER REMOVAL
38"
RADIUS 22 1/4"
126 3/4"
27 5/8"
SIDE VIEW
TOP VIEW - BOLT DOWN PATTERN
50 3/4"
22 3/8"
ELECTRO-STEAM GENERATOR CORP.
(INSTALLATION DATA) LB 100-240 (L)(MAFD)
LB 100-240
LOW PRESSURE
411-100-240-000110
This drawing and all information therein are the property of Electro-Steam Generator Corp. and shall not be disclosed, in whole or in part, to any third party without prior permission of Electro-Steam Generator Corp.

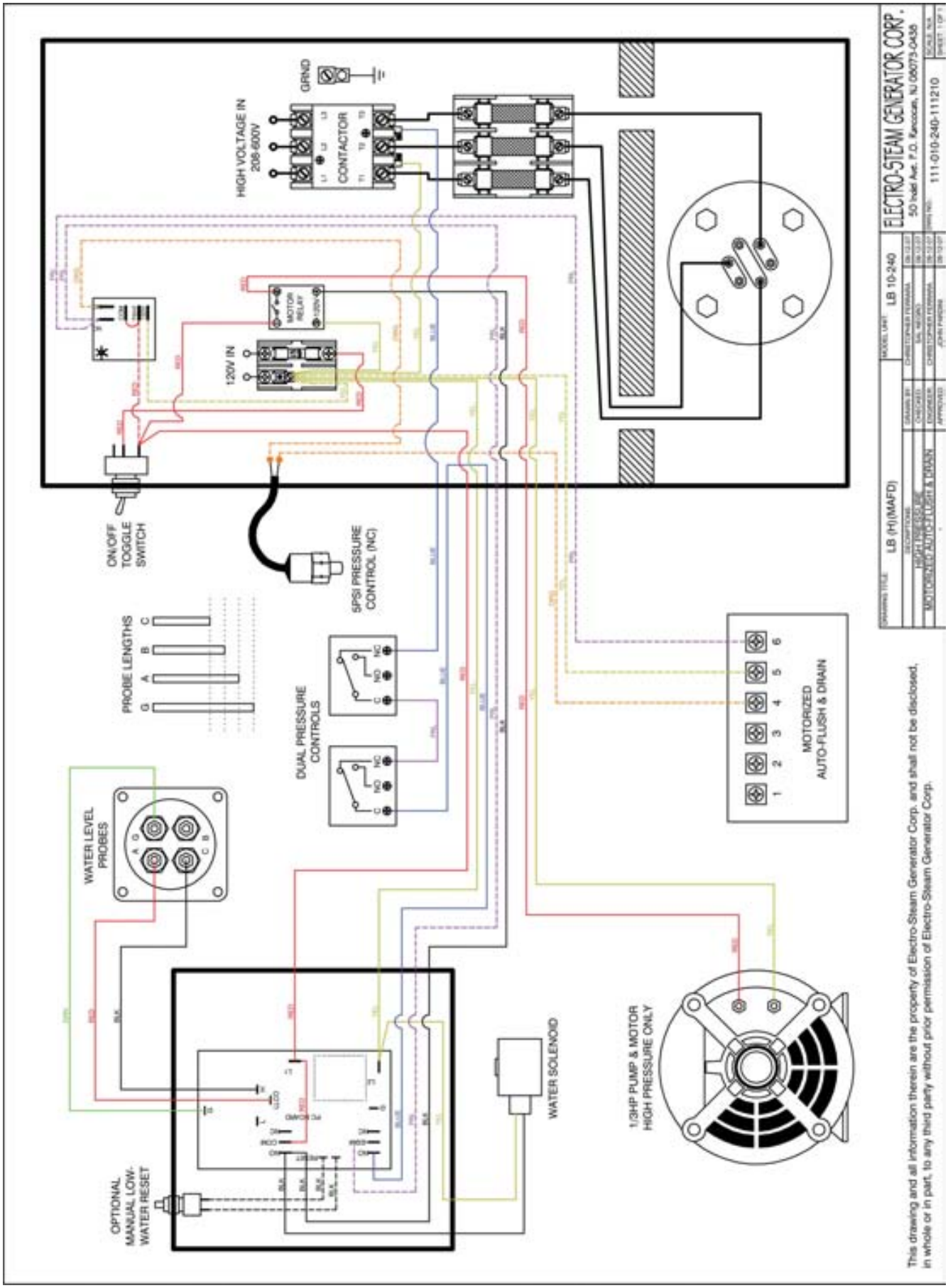

INSTALLATION DATA - LB 100-240 (H)
NOTES:
1. CONTRACTOR TO PROVIDE MINIMUM 8" CLEARANCE AROUND UNIT FOR SERVICE
2. WEIGHT OF UNIT: 750 LBS = LIVE LOAD
SEISMIC DATA AND CALCULATIONS
SHEAR LOAD GRADE 5 1/4" BOLT 2280 PSI
SEISMIC LOAD (0.50)(750) =375 LBS
MAXIMUM SHEAR LOAD ON ONE BOLT 375/4 = 93.75 PSI
FORMULA LATERAL FORCE Fp = Cp Wp
VERTICAL Cp FULL LOAD = 1
TOP VIEW
MINIMUM CLEARANCE FOR HEATER REMOVAL
38"
5 3/8"
40"
11 1/2"
11"
17 1/2"
RADIUS 22 1/4"
28 5/8"
20 1/8"
8 1/2"
5 3/8"
1/4"
126 3/4"
1 5/8"
6 1/2"
7 1/2"
27 5/8"
SIDE VIEW
40 3/4"
36 1/2"
6 3/4"
1 5/8"
26 1/2"
37 1/4"
6 3/8"
7 1/2"
10 3/4"
16 1/4"
20 1/4"
4 5/8"
2 7/8"
6 3/4"
36 1/2"
TOP VIEW - BOLT DOWN PATTERN
50 3/4"
22 3/8"
5 3/8"
7"
26"
25"
7/8"
12 3/8"
3 1/2"
22 3/8"
ELECTRO-STEAM GENERATOR CORP.
50 Inlet Ave. P.O. Pancoast, NJ 08073-0436
(INSTALLATION DATA) LB 100-240 (H)
LB 100-240
HIGH PRESSURE
411-100-240-000200
This drawing and all information therein are the property of Electro-Steam Generator Corp. and shall not be disclosed, in whole or in part, to any third party without prior permission of Electro-Steam Generator Corp.

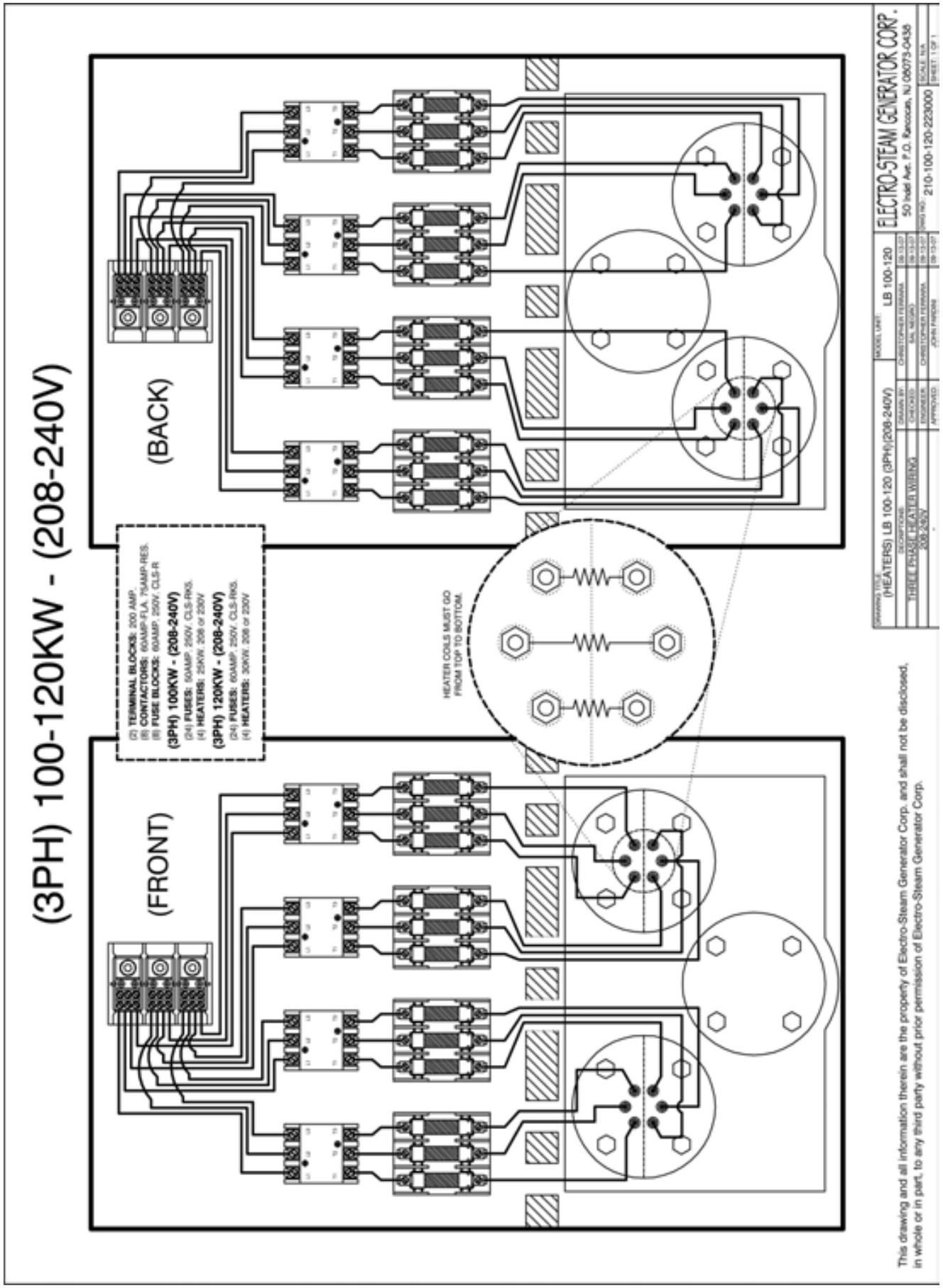

INSTALLATION DATA - LB 100-240 (H)(MAFD)
NOTES:
1. CONTRACTOR TO PROVIDE MINIMUM 8" CLEARANCE AROUND UNIT FOR SERVICE
2. WEIGHT OF UNIT: 750 LBS = LIVE LOAD
SEISMIC DATA AND CALCULATIONS
SHEAR LOAD GRADE 5 1/4" BOLT 2280 PSI
SEISMIC LOAD (0.50)(750) =375 LBS
MAXIMUM SHEAR LOAD ON ONE BOLT 375/4 = 93.75 PSI
FORMULA LATERAL FORCE Fp = Cp Wp
VERTICAL Cp FULL LOAD = 1
TOP VIEW
MINIMUM CLEARANCE FOR HEATER REMOVAL
38"
5 3/8"
40"
11 1/2"
11"
17 1/2"
8 1/2"
5 3/8"
1/4"
20 1/8"
3 1/4"
5 3/8"
28 5/8"
RADIUS 22 1/4"
126 3/4"
6 1/2"
7 1/2"
27 5/8"
SIDE VIEW
36 1/2"
40 3/4"
6 3/4"
1 5/8"
26 1/2"
37 1/4"
6 3/8"
7 1/2"
10 3/4"
16 1/4"
20 1/4"
4 5/8"
2 3/4"
2 7/8"
6 3/4"
TOP VIEW - BOLT DOWN PATTERN
50 3/4"
22 3/8"
5 3/8"
7"
26"
25"
7/8"
12 3/8"
3 1/2"
ELECTRO-STEAM GENERATOR CORP.
50 Indel Ave. P.O. Rancocas, NJ 08073-0456
(INSTALLATION DATA) LB 100-240 (H)(MAFD)
LB 100-240
411-100-240-000210
This drawing and all information therein are the property of Electro-Steam Generator Corp. and shall not be disclosed, in whole or in part, to any third party without prior permission of Electro-Steam Generator Corp.

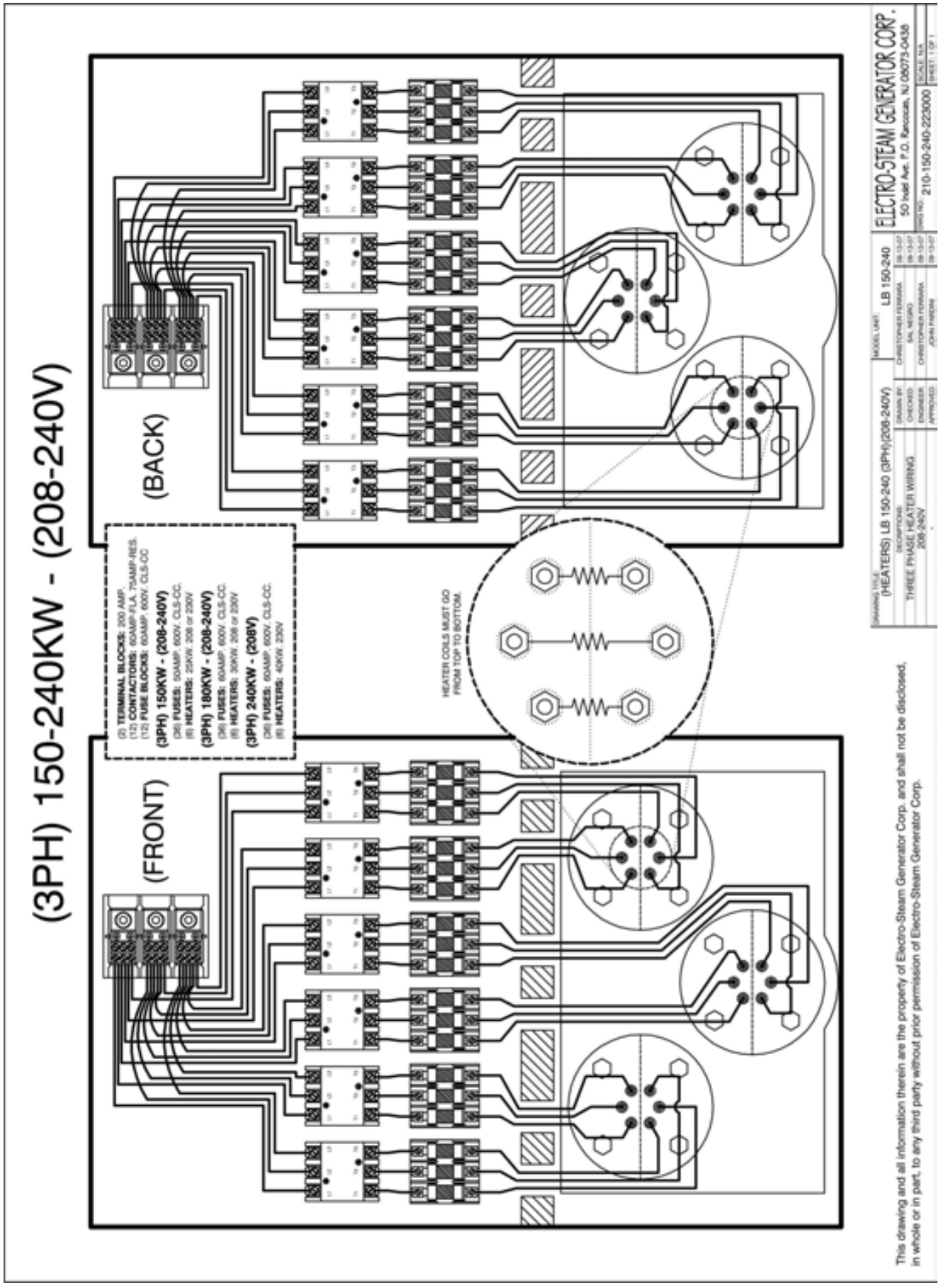

GRND
HIGH VOLTAGE IN
208-600V
CONTACTOR
120V IN
ON/OFF
TOGGLE
SWITCH
PROBE LENGTHS
A
B
C
G
DUAL PRESSURE
CONTROLS
WATER LEVEL
PROBES
OPTIONAL
MANUAL LOW-
WATER RESET
WATER SOLENOID
ELECTRO-STEAM GENERATOR CORP.
LB 10-240
LB (L)
111-010-240-111100
This drawing and all information therein are the property of Electro-Steam Generator Corp. and shall not be disclosed, in whole or in part, to any third party without prior permission of Electro-Steam Generator Corp.

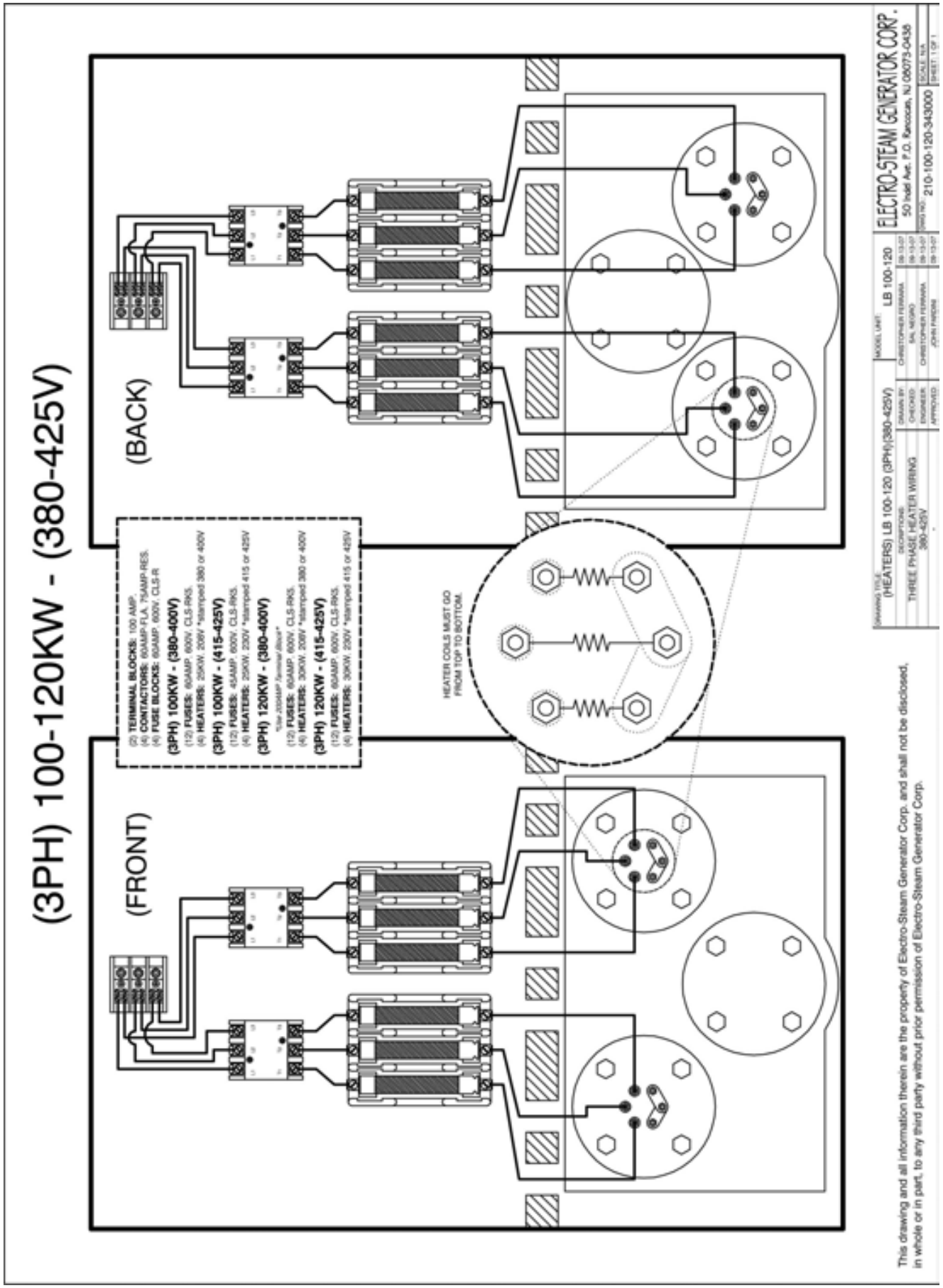

GRND
HIGH VOLTAGE IN
208-600V
CONTACTOR
120V IN
ON/OFF
TOGGLE
SWITCH
5PSI PRESSURE
CONTROL (NC)
PROBE LENGTHS
C
B
A
G
DUAL PRESSURE
CONTROLS
NC
NO
C
WATER LEVEL
PROBES
MOTORIZED
AUTO-FLUSH & DRAIN
1 2 3 4 5 6
WATER SOLENOID
OPTIONAL
MANUAL LOW-
WATER RESET
ELECTRO-STEAM GENERATOR CORP.
50 Indel Ave. P.O. Rancocas, NJ 08073-0436
LB 10-240
LB (L)MAFD)
111-010-240-111110
This drawing and all information therein are the property of Electro-Steam Generator Corp. and shall not be disclosed, in whole or in part, to any third party without prior permission of Electro-Steam Generator Corp.

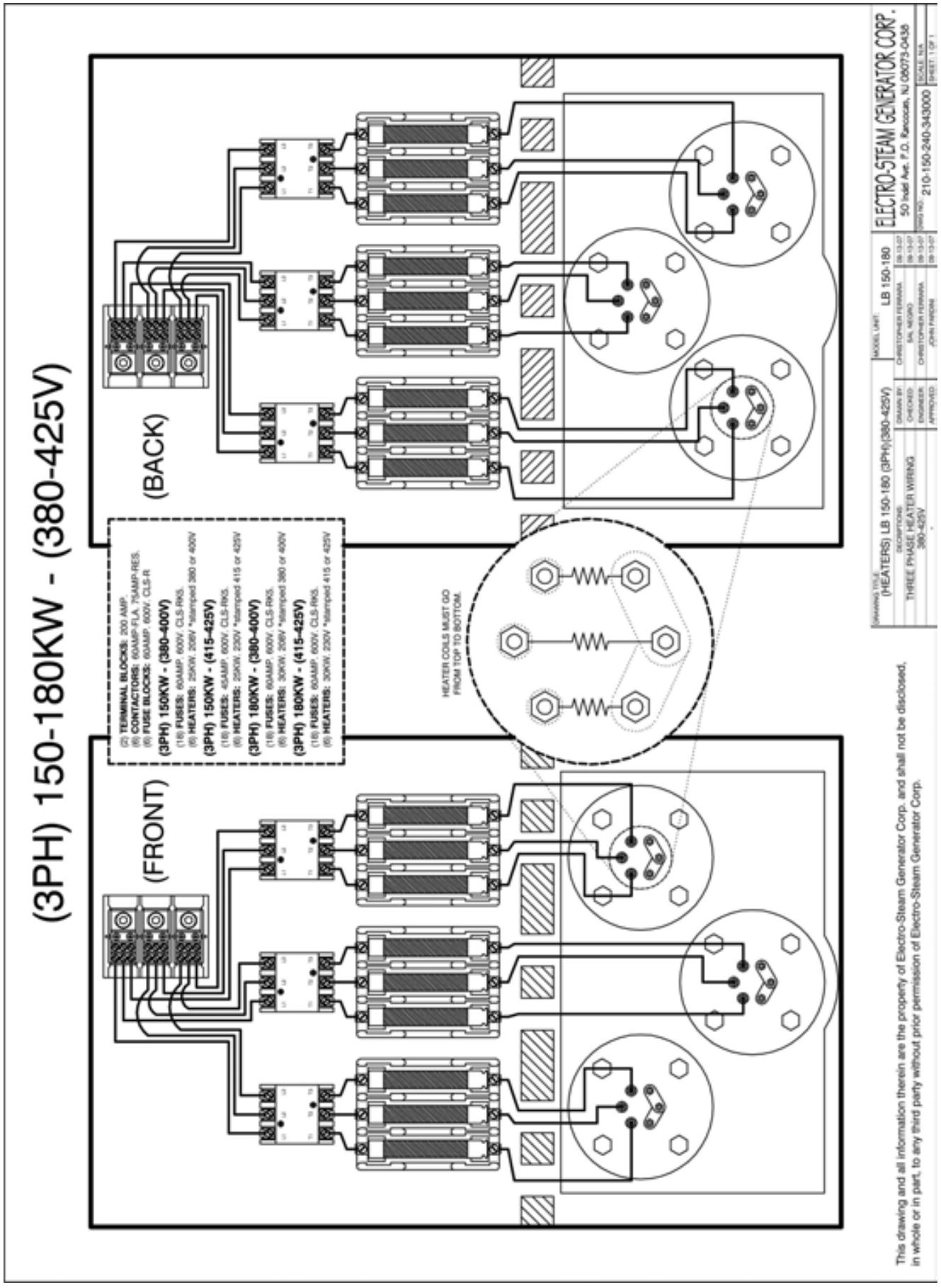

GRND
HIGH VOLTAGE IN
208-600V
CONTACTOR
MOTOR RELAY
120V IN
ON/OFF TOGGLE SWITCH
PROBE LENGTHS
C
B
A
G
DUAL PRESSURE CONTROLS
WATER LEVEL PROBES
1/3HP PUMP & MOTOR
HIGH PRESSURE ONLY
WATER SOLENOID
OPTIONAL MANUAL LOW-WATER RESET
ELECTRO-STEAM GENERATOR CORP.
50 Indel Ave. P.O. Rancocas, NJ 08073-0436
LB (H)
LB 10-240
111-010-240-111200
This drawing and all information therein are the property of Electro-Steam Generator Corp. and shall not be disclosed, in whole or in part, to any third party without prior permission of Electro-Steam Generator Corp.

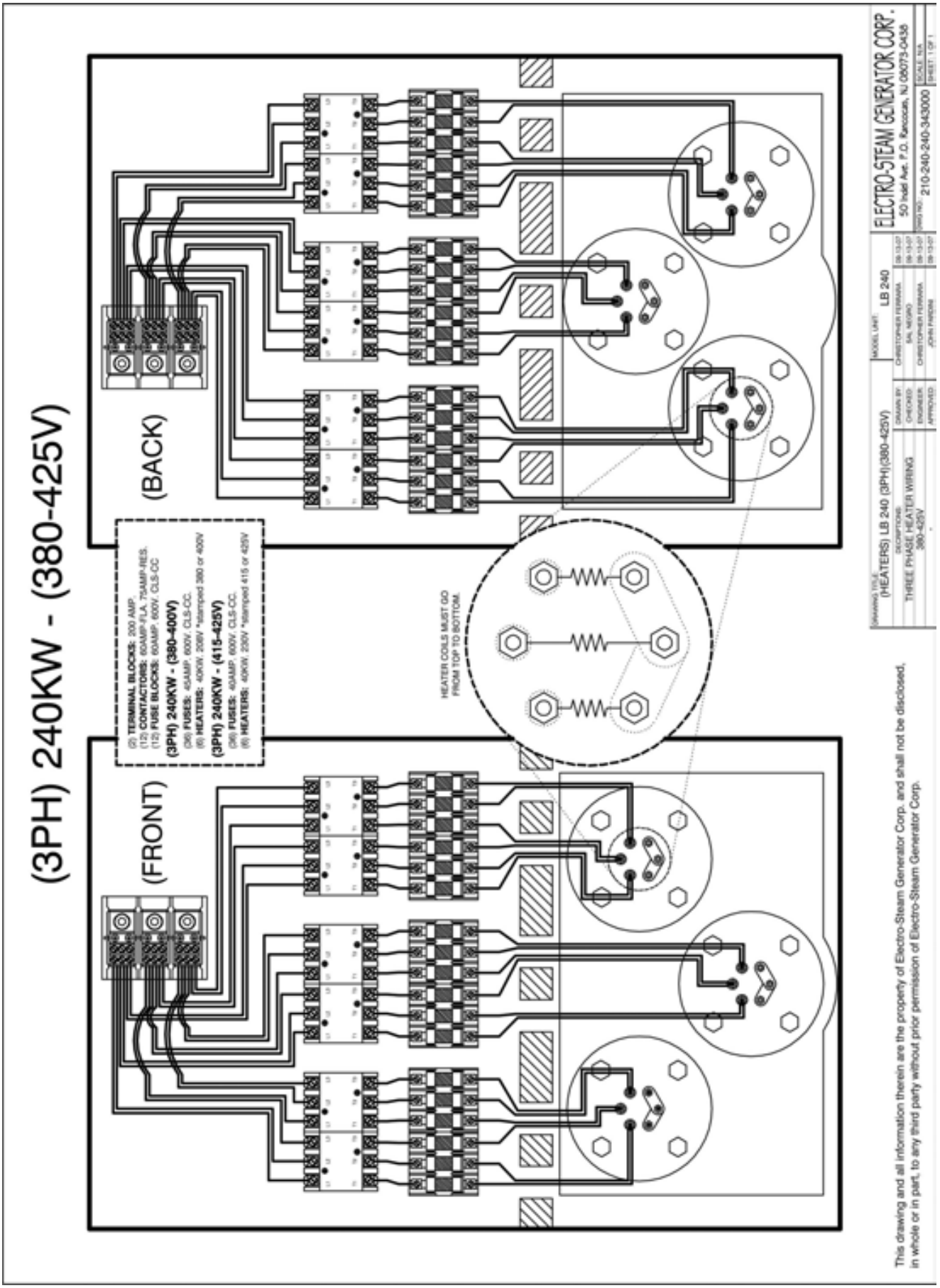

ELECTRO-STEAM GENERATOR CORP.
50 Indel Ave. P.O. Rancocas, NJ 08073-0436
111-010-240-111210
LB (H)(MAFD)
LB 10-240
HIGH VOLTAGE IN
208-600V
GRND
CONTACTOR
MOTOR RELAY
120V IN
ON/OFF TOGGLE SWITCH
SPSI PRESSURE CONTROL (NC)
PROBE LENGTHS
DUAL PRESSURE CONTROLS
MOTORIZED AUTO-FLUSH & DRAIN
WATER LEVEL PROBES
WATER SOLENOID
1/3HP PUMP & MOTOR HIGH PRESSURE ONLY
OPTIONAL MANUAL LOW-WATER RESET
This drawing and all information therein are the property of Electro-Steam Generator Corp. and shall not be disclosed, in whole or in part, to any third party without prior permission of Electro-Steam Generator Corp.

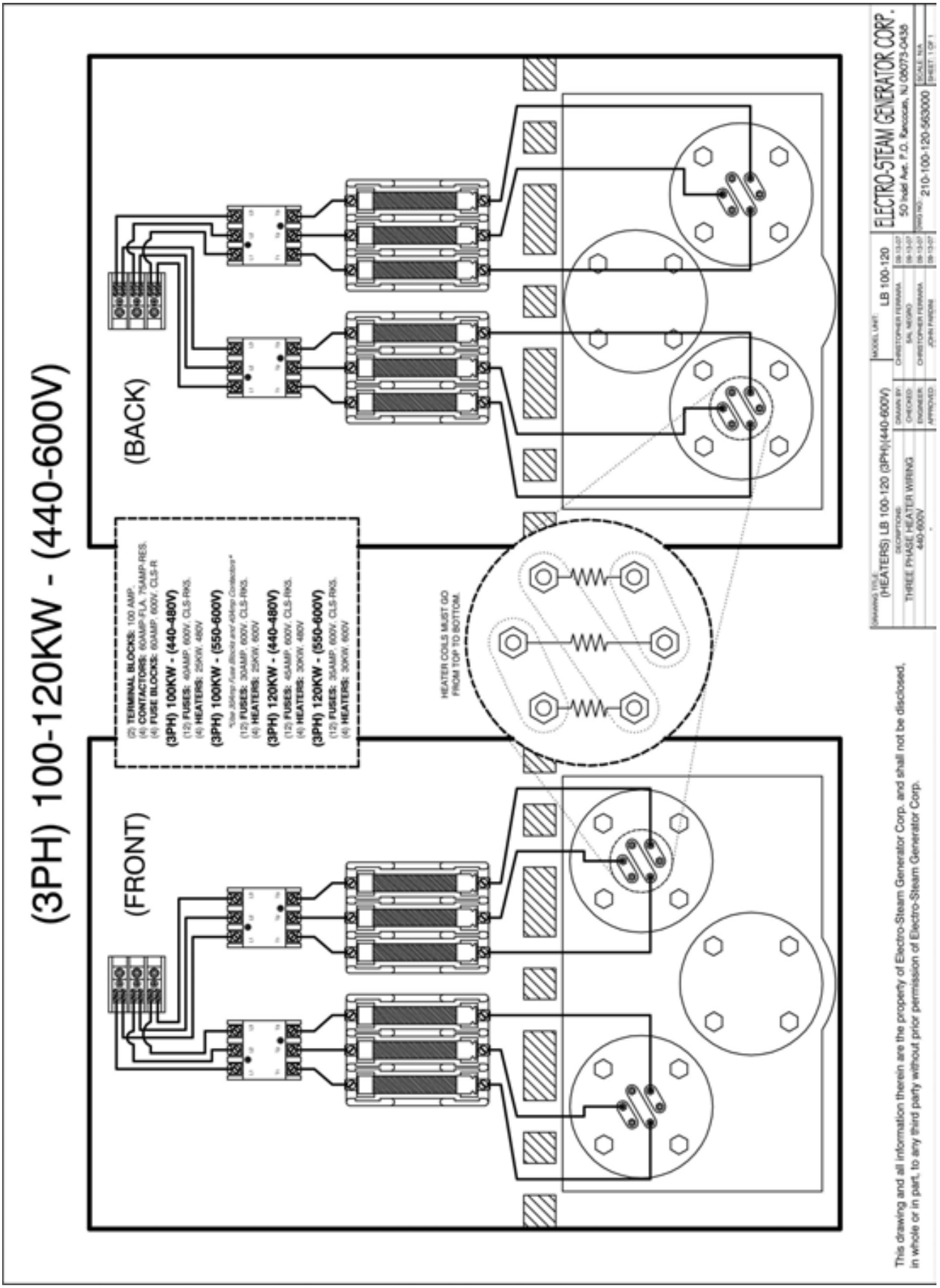

(3PH) 100-120KW - (208-240V)
(FRONT)
(BACK)
(2) TERMINAL BLOCKS: 200 AMP.
(8) CONTACTORS: 60AMP-FLA, 75AMP-RES.
(8) FUSE BLOCKS: 60AMP, 250V, CLS-R
(3PH) 100KW - (208-240V)
(24) FUSES: 60AMP, 250V, CLS-RKS.
(4) HEATERS: 25KW, 208 or 230V
(3PH) 120KW - (208-240V)
(24) FUSES: 60AMP, 250V, CLS-RKS.
(4) HEATERS: 30KW, 208 or 230V
HEATER COILS MUST GO FROM TOP TO BOTTOM.
(HEATERS) LB 100-120 (3PH)/(208-240V)
LB 100-120
ELECTRO-STEAM GENERATOR CORP.
50 Indel Ave. P.O. Rancocas, NJ 08073-0436
210-100-120-223000
This drawing and all information therein are the property of Electro-Steam Generator Corp. and shall not be disclosed, in whole or in part, to any third party without prior permission of Electro-Steam Generator Corp.

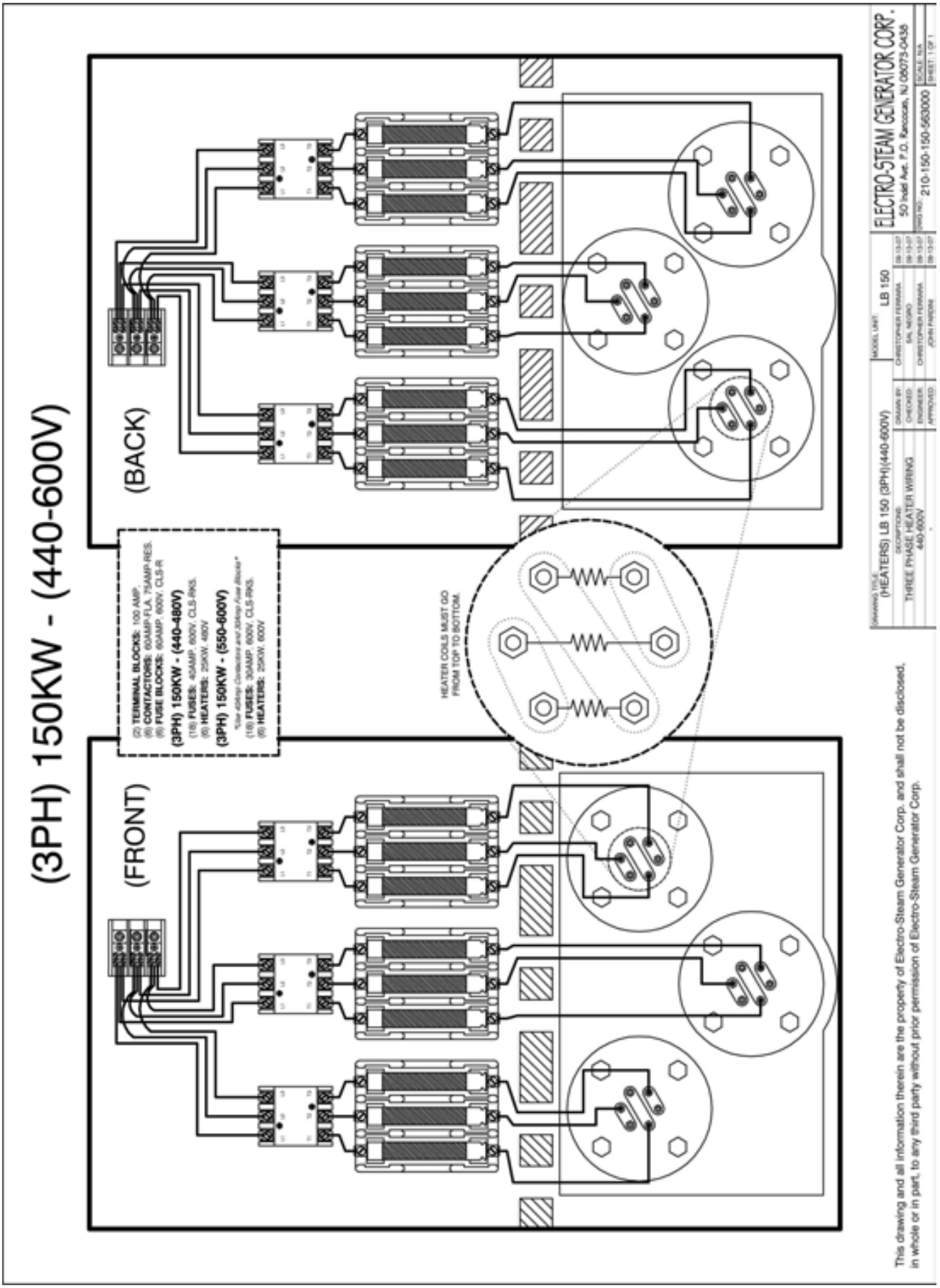

(3PH) 150-240KW - (208-240V)
(FRONT)
(BACK)
(2) TERMINAL BLOCKS: 200 AMP.
(12) CONTACTORS: 60AMP-FLA, 75AMP-RES.
(12) FUSE BLOCKS: 60AMP, 600V, CLS-CC
(3PH) 150KW - (208-240V)
(36) FUSES: 20AMP, 600V, CLS-CC.
(6) HEATERS: 25KW, 208 or 230V
(3PH) 180KW - (208-240V)
(36) FUSES: 60AMP, 600V, CLS-CC.
(6) HEATERS: 30KW, 208 or 230V
(3PH) 240KW - (208V)
(36) FUSES: 60AMP, 600V, CLS-CC.
(6) HEATERS: 40KW, 230V
HEATER COILS MUST GO FROM TOP TO BOTTOM.
(HEATERS) LB 150-240 (3PH)/(208-240V)
LB 150-240
THREE PHASE HEATER WIRING
208-240V
ELECTRO-STEAM GENERATOR CORP.
50 Indel Ave. P.O. Rancocas, NJ 08073-0436
210-150-240-223000
This drawing and all information therein are the property of Electro-Steam Generator Corp. and shall not be disclosed, in whole or in part, to any third party without prior permission of Electro-Steam Generator Corp.

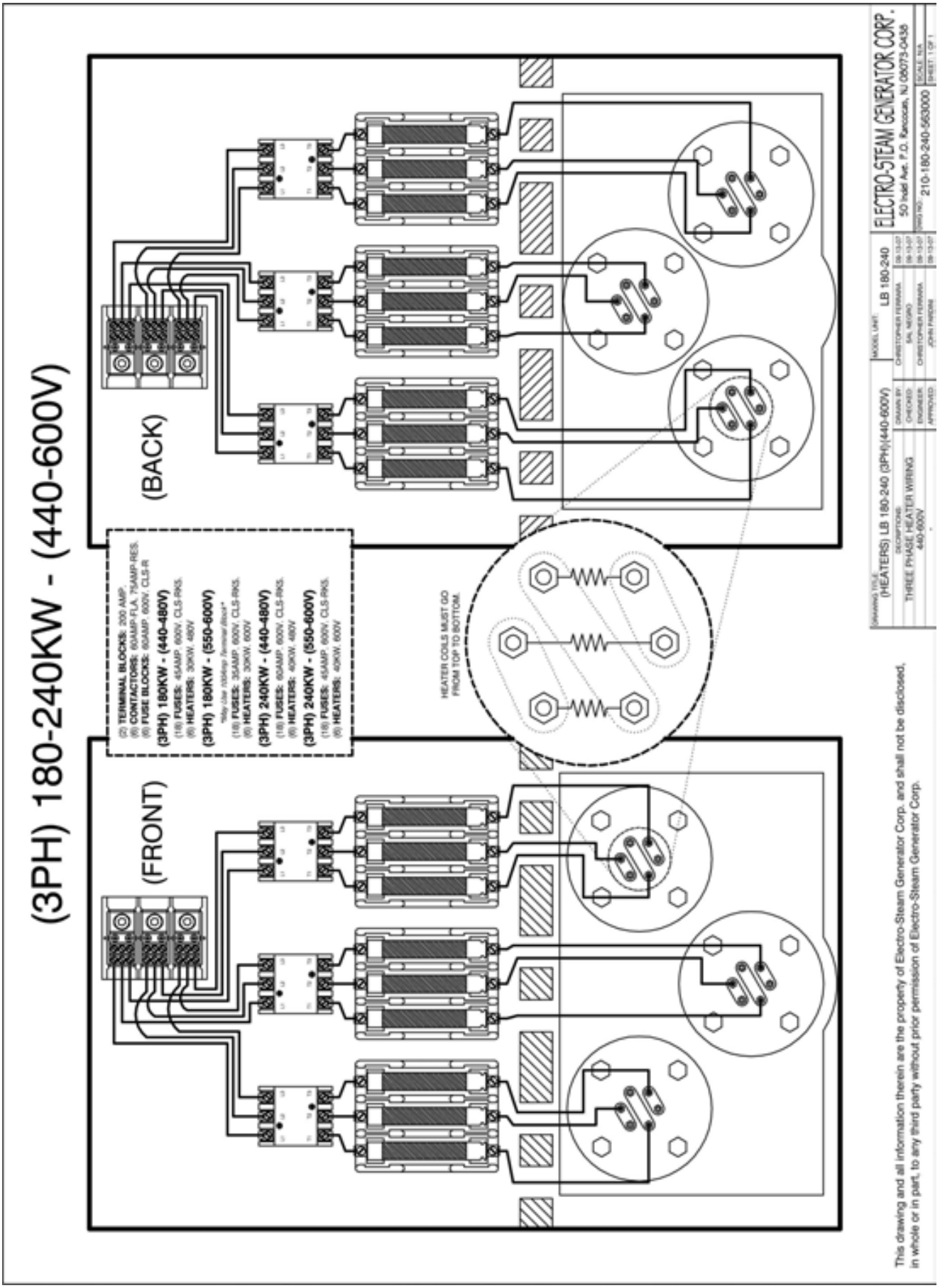

(3PH) 100-120KW - (380-425V)
(FRONT)
(BACK)
(2) TERMINAL BLOCKS: 100 AMP.
(4) CONTACTORS: 60AMP-F.L.A. 75AMP.RES.
(4) FUSE BLOCKS: 60AMP, 600V, CLS-R
(3PH) 100KW - (380-400V)
(12) FUSES: 60AMP, 600V, CLS-RKS.
(4) HEATERS: 25KW, 208V *stamped 380 or 400V
(3PH) 100KW - (415-425V)
(12) FUSES: 45AMP, 600V, CLS-RKS.
(4) HEATERS: 25KW, 230V *stamped 415 or 425V
(3PH) 120KW - (380-400V)
Use 200AMP Terminal Block
(12) FUSES: 60AMP, 600V, CLS-RKS.
(4) HEATERS: 30KW, 208V *stamped 380 or 400V
(3PH) 120KW - (415-425V)
(12) FUSES: 60AMP, 600V, CLS-RKS.
(4) HEATERS: 30KW, 230V *stamped 415 or 425V
HEATER COILS MUST GO FROM TOP TO BOTTOM.
DRAWING TITLE
(HEATERS) LB 100-120 (3PH)/(380-425V)
MODEL UNIT
LB 100-120
DESCRIPTIONS
THREE PHASE HEATER WIRING
380-425V
DRAWN BY
CHECKED
ENGINEER
APPROVED
CHRISTOPHER FERRARA
CHRISTOPHER FERRARA
JOHN PARDINI
ELECTRO-STEAM GENERATOR CORP.
50 Indel Ave. P.O. Rancocas, NJ 08073-0436
DRAWING NO. 210-100-120-343000
SCALE: N/A
SHEET 1 OF 1
This drawing and all information therein are the property of Electro-Steam Generator Corp. and shall not be disclosed, in whole or in part, to any third party without prior permission of Electro-Steam Generator Corp.


(3PH) 150-180KW - (380-425V)
(FRONT)
(BACK)
(2) TERMINAL BLOCKS: 200 AMP.
(6) CONTACTORS: 60AMP-FLA, 75AMP-RES.
(6) FUSE BLOCKS: 60AMP, 600V, CLS-R
(3PH) 150KW - (380-400V)
(18) FUSES: 60AMP, 600V, CLS-RKS.
(6) HEATERS: 25KW, 208V *stamped 380 or 400V
(3PH) 150KW - (415-425V)
(18) FUSES: 45AMP, 600V, CLS-RKS.
(6) HEATERS: 25KW, 230V *stamped 415 or 425V
(3PH) 180KW - (380-400V)
(18) FUSES: 60AMP, 600V, CLS-RKS.
(6) HEATERS: 30KW, 208V *stamped 380 or 400V
(3PH) 180KW - (415-425V)
(18) FUSES: 60AMP, 600V, CLS-RKS.
(6) HEATERS: 30KW, 230V *stamped 415 or 425V
HEATER COILS MUST GO FROM TOP TO BOTTOM.
(HEATERS) LB 150-180 (3PH)/(380-425V)
LB 150-180
ELECTRO-STEAM GENERATOR CORP.
50 Indel Ave. P.O. Rancocas, NJ 08073-0438
THREE PHASE HEATER WIRING
380-425V
210-150-240-343000
This drawing and all information therein are the property of Electro-Steam Generator Corp. and shall not be disclosed, in whole or in part, to any third party without prior permission of Electro-Steam Generator Corp.


(3PH) 240KW - (380-425V)
(FRONT)
(BACK)
(2) TERMINAL BLOCKS: 200 AMP.
(12) CONTACTORS: 60AMP-FLA, 75AMP-RES.
(12) FUSE BLOCKS: 60AMP, 600V, CLS-CC
(3PH) 240KW - (380-400V)
(36) FUSES: 45AMP, 600V, CLS-CC.
(6) HEATERS: 40KW, 208V *stamped 380 or 400V
(3PH) 240KW - (415-425V)
(36) FUSES: 40AMP, 600V, CLS-CC.
(6) HEATERS: 40KW, 230V *stamped 415 or 425V
HEATER COILS MUST GO FROM TOP TO BOTTOM.
(HEATERS) LB 240 (3PH)(380-425V)
LB 240
THREE PHASE HEATER WIRING
380-425V
ELECTRO-STEAM GENERATOR CORP.
50 Indel Ave. P.O. Rancocas, NJ 08073-0436
210-240-240-343000
This drawing and all information therein are the property of Electro-Steam Generator Corp. and shall not be disclosed, in whole or in part, to any third party without prior permission of Electro-Steam Generator Corp.


(3PH) 100-120KW - (440-600V)
(FRONT)
(BACK)
(2) TERMINAL BLOCKS: 100 AMP.
(4) CONTACTORS: 60AMP-FLA, 75AMP-RES.
(4) FUSE BLOCKS: 60AMP, 600V, CLS-R
(3PH) 100KW - (440-480V)
(12) FUSES: 40AMP, 600V, CLS-RKS.
(4) HEATERS: 25KW, 480V
(3PH) 100KW - (550-600V)
Use 30Amp Fuse Blocks and 40Amp Contactors
(12) FUSES: 30AMP, 600V, CLS-RKS.
(4) HEATERS: 25KW, 600V
(3PH) 120KW - (440-480V)
(12) FUSES: 45AMP, 600V, CLS-RKS.
(4) HEATERS: 30KW, 480V
(3PH) 120KW - (550-600V)
(12) FUSES: 35AMP, 600V, CLS-RKS.
(4) HEATERS: 30KW, 600V
HEATER COILS MUST GO FROM TOP TO BOTTOM.
(HEATERS) LB 100-120 (3PH)/(440-600V)
LB 100-120
THREE PHASE HEATER WIRING
440-600V
ELECTRO-STEAM GENERATOR CORP.
50 Indel Ave. P.O. Rancocas, NJ 08073-0436
210-100-120-563000
This drawing and all information therein are the property of Electro-Steam Generator Corp. and shall not be disclosed, in whole or in part, to any third party without prior permission of Electro-Steam Generator Corp.


(3PH) 150KW - (440-600V)
(FRONT)
(BACK)
(2) TERMINAL BLOCKS: 100 AMP.
(6) CONTACTORS: 60AMP FLA, 75AMP RES.
(6) FUSE BLOCKS: 60AMP, 600V, CLS-R
(3PH) 150KW - (440-480V)
(18) FUSES: 40AMP, 600V, CLS-RKS.
(6) HEATERS: 25KW, 480V
(3PH) 150KW - (550-600V)
(18) FUSES: 30AMP, 600V, CLS-RKS.
(6) HEATERS: 25KW, 600V
HEATER COILS MUST GO FROM TOP TO BOTTOM.
(HEATERS) LB 150 (3PH)(440-600V)
LB 150
ELECTRO-STEAM GENERATOR CORP.
50 Indel Ave. P.O. Rancocas, NJ 08073-0436
THREE PHASE HEATER WIRING
440-600V
CHRISTOPHER FERRARA
SAL NEGRO
CHRISTOPHER FERRARA
JOHN PARONI
210-150-150-563000
This drawing and all information therein are the property of Electro-Steam Generator Corp. and shall not be disclosed, in whole or in part, to any third party without prior permission of Electro-Steam Generator Corp.


(3PH) 180-240KW - (440-600V)
(FRONT)
(BACK)
(2) TERMINAL BLOCKS: 200 AMP.
(6) CONTACTORS: 60AMP-FLA, 75AMP-RES.
(6) FUSE BLOCKS: 60AMP, 600V, CLS-R
(3PH) 180KW - (440-480V)
(18) FUSES: 45AMP, 600V, CLS-RKS.
(6) HEATERS: 30KW, 480V
(3PH) 180KW - (550-600V)
May Use 100Amp Terminal Block
(18) FUSES: 35AMP, 600V, CLS-RKS.
(6) HEATERS: 30KW, 600V
(3PH) 240KW - (440-480V)
(18) FUSES: 60AMP, 600V, CLS-RKS.
(6) HEATERS: 40KW, 480V
(3PH) 240KW - (550-600V)
(18) FUSES: 45AMP, 600V, CLS-RKS.
(6) HEATERS: 40KW, 600V
HEATER COILS MUST GO FROM TOP TO BOTTOM.
(HEATERS) LB 180-240 (3PH)/(440-600V)
LB 180-240
THREE PHASE HEATER WIRING
440-600V
ELECTRO-STEAM GENERATOR CORP.
50 Indel Ave. P.O. Rancocas, NJ 08073-0436
210-180-240-563000
This drawing and all information therein are the property of Electro-Steam Generator Corp. and shall not be disclosed, in whole or in part, to any third party without prior permission of Electro-Steam Generator Corp.

Electro-Steam Generator Corporation Terms and Conditions of Sale

These terms and conditions apply to all goods or services Seller provides. Seller recognizes no other terms and conditions unless approved in writing by Seller's authorized representative. Seller rejects any additional terms and conditions that may be contained in any document provided previously or subsequently by your company.

CHANGES: Changes made after fabrication has begun shall be submitted in writing, signed by the purchaser. Purchaser agrees to pay the cost of any changes. The specifications and prices are subject to change without notice.

CLAIMS: Title passes to the buyer upon delivery to the carrier, unless otherwise indicated. Safe delivery is the responsibility of the carrier. Damaged merchandise, if accepted, should be noted on the delivery receipt and on the freight bill before acceptance of shipment. Make claim promptly.

CONTINGENCY: All contracts are contingent upon fire, strikes, accidents, delays in transit, acts of God or other causes beyond our control.

LOCAL CODES: All steam boilers are built in accordance with ASME miniature boiler code. NOTE: It is the responsibility of the installer to conform with any state or local codes. If further inspection following modification by the installer is required under state and local codes that is the responsibility of the local installer

FREIGHT TERMS: F.O.B. FACTORY, NO FREIGHT ALLOWED. All charges for unloading and transportation to job site are at the buyer's expense.

INSTALLATION: No installation or job supervision charges are included.

ORDERS: All orders resulting from this quotation are subject to acceptance by the factory. No production will begin until receipt of purchaser's signed order and credit approval.

PAYMENT TERMS: Within Continental U.S.A., net 30 days, with approved credit from the date of invoice (not date of arrival of goods). Payment in full without retainer and/or any unauthorized sums deducted is expected.

RETURNS OF MATERIAL: No goods will be accepted for return without a return authorization number from the factory. A 25% restocking fee is charged on returns, freight prepaid.

TAXES: No taxes of any kind are included. All prices herein and/or contracts shall be subject to increase without notice by the amount of present or future sales or excise tax levied or charged, either by Federal, State or any other assessing agency.

PATENTS: Seller agrees to indemnify Purchaser against any proven claim and assessed liability for infringement of any United States patent arising from the manufacture or sale of any apparatus furnished by Seller to Purchaser.

THE FOREGOING STATES SELLER'S ENTIRE LIABILITY FOR CLAIMS OR PATENT INFRINGEMENT. Seller shall have no liability whatsoever if the claim of infringement arises out of the Sellers compliance with Purchasers specifications. Seller shall have no liability whatsoever if a claim of infringement is based upon the Purchasers use of the equipment as part of a patented combination where the other elements of the combination are not supplied by Seller, or in the practice of a patented process. Where the specifications, process, design are supplied by Purchaser, then Purchaser agrees to indemnify the Seller in like manner.of the claim or suit; and (c) purchaser provides all information and assistance to Electro-Steam Corporation, at purchaser's expense, as is reasonably necessary for the defense of the claim or suit. Electro-Steam Generator Corporation may, at its option, intervene in any suit or action brought against the purchaser on such claim.

ELECTRO-STEAM GENERATOR CORPORATION LIMITED WARRANTY:
Electro-Steam Generator Corporation fully warrants that all equipment and service supplied shall conform to the description in the quotation and agrees to repair or replace F.O.P. shipping points any parts, excepting expendable items, that fail due to defects in material or workmanship. The pressure vessel; (steam chamber) are warranted to the original Purchaser for a period of five years from the date of shipment from our factory. Mechanical and electrical components, along with accessories and hoses, are warranted for a period of one (1) year from date of shipment from our factory. IN NO EVENT SHALL ELECTRO-STEAM GENERATOR CORPORATION'S WARRANTY BE EXTENDED BEYOND THE WARRANTY LIABILITY PROVIDED BY THE SUPPLIER OR MANUFACTURER OF COMPONENT PARTS INCORPORATED IN THIS EQUIPMENT. THERE ARE NO OTHER WARRANTIES OF ANY KIND, EXPRESSED OR IMPLIED, AND SPECIFICALLY EXCLUDED BUT NO BY WAY OF LIMITATION ARE THE IMPLIED WARRANTIES OF FITNESS FOR PARTICULAR PURPOSE AND MERCHANTABILITY.

All claims for incorrect products or replacement must be made and settled prior to installation. Electro-steam Generator Corporation assumes no liability for the expense of repairs made outside its factory. Any claims for labor and/or parts will be denied unless written authorization is given by Electro-Steam Generator Corporation prior to work being done.

IT IS UNDERSTOOD AND AGREED THAT ELECTRO-STEAM GENERATOR CORPORATION'S LIABILITY, WHETHER IN CONTRACT, IN TORT, UNDER ANY WARRANTY, IN NEGLIGENCE OR OTHERWISE, SHALL NOT EXCEED THE COST OF REPAIR OR REPLACEMENT, F.O.B. SHIPPING POINTS OF DEFECTIVE PARTS. UNDER NO CIRCUMSTANCES SHALL ELECTRO-STEAM GENERATOR CORPORATION BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES. THE PRICE STATED FOR THE EQUIPMENT IS A CONSIDERATION IN LIMITING ELECTRO-STEAM GENERATOR CORPORATION'S LIABILITY. NO ACTION, REGARDLESS OF FORM, ARISING OUT OF THE TRANSACTIONS OF THIS AGREEMENT MAY BE BROUGHT BY PURCHASER MORE THAN ONE YEAR AFTER THE CAUSE OF ACTION HAS ACCRUED. THE WARRANTY FOR THIS EQUIPMENT
OR SERVICE PROPOSED IN THIS QUOTATION IS AS STATED IN THE AFOREMENTIONED PARAGRAPHS. IT IS NOT RESTATED NOR DOES IT APPEAR IN ANY OTHER FORM.

This warranty supersedes all prior verbal or written warranties.

INSURANCE: Buyer represents that they have a program of Insurance which adequately protects their interest, and that of their employees and agents, including damage to plant, property and equipment, personal injury of any kind, directly or indirectly related in any way to the equipment, service, repair or parts supplied by Seller. Accordingly, Buyer waives any claim against Seller for the foregoing, and on behalf of its Insurance Company, any right of subrogation in connection therewith.

LAW: This Agreement shall be governed by the internal laws of the State of New Jersey, USA, and any claims arising hereunder shall be prosecuted in the United States District Court having jurisdiction of causes of action arising in the District in which Seller is located.

rev 06042007